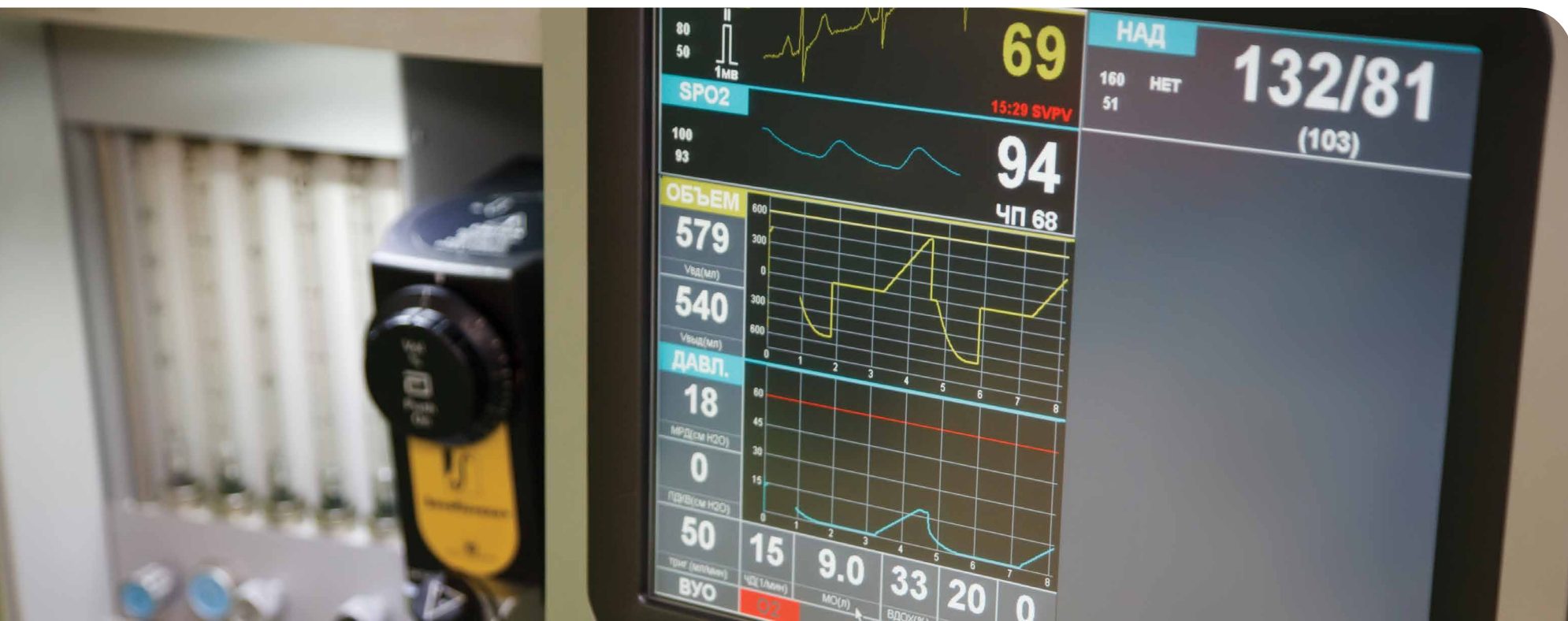




Kinetis K Series Microcontrollers (MCUs)

Selector Guide

A Performance and Integration Series

Based on 32-bit Arm® Cortex®-M4 Cores

May 2018



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Kinetis K Series MCUs

Our Kinetis K series MCU portfolio includes more than 600 compatible low-power, high-performance 32-bit MCUs built on the Arm® Cortex®-M4 core. This series is designed for scalable performance, integration, connectivity, communications, HMI and security, offering additional features for exceptional integration in a variety of package options.

Ultra Scalable – Preserve your engineering investments with hundreds of Kinetis MCUs providing unsurpassed availability and scalability of up to 2 MB flash and 1 MB SRAM, while offering software and hardware compatibility.

Optimized Integration – Reduce overall BOM cost with options for smart-on-chip integration including HMI, security, mixed-signal capabilities, and connectivity options such as USB with crystal-less functionality.

Performance and Power Efficiency – Experience the best in performance, up to 180 MHz with floating point unit, and take advantage of extended battery life with multiple low-power modes and enhanced power-conscious peripherals.

Comprehensive Enablement – Speed application development with an extensive suite of software and tools from our company and other Arm ecosystem providers.

Longevity Program – Most of the Kinetis K series MCU sub-families now support up to 15-year manufacturing longevity from their respective launch date. Check www.nxp.com/productlongevity for more information.

COMPREHENSIVE ENABLEMENT SOLUTIONS

Find the information you need to get started at www.nxp.com/Kinetis.

Getting Started

- ▶ MCUXpresso Software and tools for Kinetis MCUs
- ▶ Online product selector guide
- ▶ Kinetis MCU Community

Development Boards

- ▶ Low-cost Freedom Development Platform
- ▶ Tower System development platforms

MCUXpresso SDK

- ▶ Extensive suite of robust peripheral drivers, stacks and middleware
- ▶ Includes software examples demonstrating the usage of the HAL, peripheral drivers, middleware and RTOS
- ▶ Operating system abstraction (OSA) for FreeRTOS and baremetal (no RTOS) applications

Integrated Development Environments (IDE)

- ▶ Green Hills Software MULTI
- ▶ IAR Embedded Workbench®
- ▶ Arm Keil® MCU Development Kit
- ▶ MCUXpresso IDE – No-cost, Eclipse and GCC-based IDE for C/C++ editing, compiling and debugging
- ▶ Broad Arm ecosystem support through the Connect Partner Program

Online Enablement with Arm mbed™ Development Platform

- ▶ Rapid and easy prototyping and development for Kinetis MCUs
- ▶ Online mbed SDK, Developer Community
- ▶ Free software libraries

Kinetis Bootloader

- ▶ Common bootloader for Kinetis MCUs
- ▶ In-system flash programming over a serial connection: erase, program, verify
- ▶ ROM or flash-based bootloader with open source software and host-side programming utilities

Kinetis® K Series: High Performance Microcontrollers (MCUs) based on Arm® Cortex®-M4 Core

Kinetis K series MCUs, based on the Arm® Cortex®-M4 core, offer optimized performance, scalable integration and low-power capabilities.

STANDARD KEY FEATURES

UART, I²C, I²S, SPI, 16-BIT ADC, 12-BIT DAC, TIMERS, COMPARATORS AND GPIO.

	CPU			Comms			HMI		Security		
Product	Arm Cortex-M4	Memory	Packages	Ethernet	CAN	USB	SVGA LCD	Segment LCD	HW Encryption	Tamper Detection	Encr. Firmware Upd.
K8x Scalable and Secure	150 MHz	256 KB Flash 256 KB SRAM, XIP QuadSPI	LQFP, MAPBGA, WLCSP			Y			Y	Y	Y
K7x Graphic LCD	120–150 MHz	1 MB Flash 128 KB SRAM	MAPBGA	Y	Y	Y	Y		Y	Y	
K6x Ethernet	100–180 MHz	256 KB–2 MB Flash 64–256 KB SRAM	LQFP, MAPBGA, WLCSP	Y	Y	Y			Y	Y	
K5x Measurement	72–100 MHz	160–512 KB Flash 32–128 KB SRAM	LQFP, MAPBGA	Y		Y		Y	Y		
K4x USB and segment LCD	72–100 MHz	64–512 KB Flash 16–128 KB SRAM	LQFP, MAPBGA		Y	Y		Y			
K3x Segment LCD	72–100 MHz	64–512 KB Flash 16–128 KB SRAM	LQFP, MAPBGA		Y			Y			
K2x USB	50–180 MHz	32 KB–2 MB Flash 8 KB - 1 MB SRAM, XIP QuadSPI	LQFP, QFN, MAPBGA, WLCSP		Y	Y			Y	Y	
K1x Mainstream	50–120 MHz	32 KB–1 MB Flash 8–128 KB SRAM	LQFP, QFN, MAPBGA		Y				Y	Y	
K0x Entry-level	100 MHz	64–128 KB Flash 16 KB SRAM	LQFP, QFN								

Kinetis K0x Family of Entry-Level MCUs

OVERVIEW

The Kinetis K0x MCU family, based on the Arm Cortex-M4 core, is the new entry point into the Kinetis K series MCU portfolio and provides a bridge from the Kinetis L series MCU family. Devices start from 64 KB of flash and are offered in several small-footprint package options. The Kinetis K0x MCU family provides the perfect balance of performance and power consumption, running at 100 MHz with floating point unit, while offering low dynamic power consumption and best-in-class static current consumption with more than 10 flexible low-power modes. Each family member combines the ultra-low-power performance with a streamlined level of integration optimized to meet the needs of a broad number of applications. For more information about the Kinetis K0x MCU family, [click here](#).

TARGET APPLICATIONS:

Consumer devices, health and wellness monitors, home and building automation, industrial/commercial sensor nodes, sports and activity wearables

KINETIS K0X ENTRY-LEVEL MCU

	CPU		Communications			Analog			Security	
Product	Arm Cortex-M4	Embedded Memory	UART	SPI	I ² C	Comparator	16-bit SAR ADC	12-bit DAC	CRC	Packages
K02 Entry Level	100 MHz w/Single Precision FPU	64–128 KB Flash 16 KB SRAM	2	1	1	2	1	1	Y	48/64 LQFP 32 QFN

K02 SUB-FAMILY: OPTIMIZED ENTRY-LEVEL MCUs

Footnotes	Part Number	CPU Frequency	Single Precision FPU	DMA	Package	Pin Count	GPIOs	Total Flash (KB)	SRAM (KB)	UART (Total) High Baudrate	I ² S	USB device/host ⁴	SPI (# of modules)	SPI Chip Selects	I ² C	Periodic Interrupt Timer (32-bit)	Motor Control PWM	Quad Decoder PWM	FTM External Clock	Low Power Timer	Programmable Delay Block	16-bit SAR ADC	Total 16-bit ADC DP	Single Ended ADC channel	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Cyclic Redundancy Check (CRC)	Evaluation Board (See Page 17)
	MK02FN128VFM10	100 MHz	Y	4ch	QFN	32	26	128	16	2	1	4	1	1x4ch	1x6ch	2x2ch	2	1	1	1	-	13	1	2	2/3	Y	Y	T5, F2	LQFP144, TFBGA100	Flashless
	MK02FN128VLF10	100 MHz	Y	4ch	LQFP	48	35	128	16	2	1	5	1	1x4ch	1x6ch	2x2ch	2	1	1	1	1ch	21	1	2	3/4	Y	Y	T5, F2	LQFP144, TFBGA100	Single-bank flash
	MK02FN128VLH10	100 MHz	Y	4ch	LQFP	64	46	128	16	2	1	5	1	1x4ch	1x6ch	2x2ch	2	1	1	1	2ch	24	1	2	6/4	Y	Y	T5, F2	LQFP144, TFBGA100	Dual-bank flash
	MK02FN64VFM10	100 MHz	Y	4ch	QFN	32	26	64	16	2	1	4	1	1x4ch	1x6ch	2x2ch	2	1	1	1	-	13	1	2	2/3	Y	Y	T5, F2	LQFP144, TFBGA100	Dual-bank flash
	MK02FN64VLF10	100 MHz	Y	4ch	LQFP	48	35	64	16	2	1	5	1	1x4ch	1x6ch	2x2ch	2	1	1	1	1ch	21	1	2	3/4	Y	Y	T5, F2	LQFP144, TFBGA100	Dual-bank flash
	MK02FN64VLH10	100 MHz	Y	4ch	LQFP	64	46	64	16	2	1	5	1	1x4ch	1x6ch	2x2ch	2	1	1	1	2ch	24	1	2	6/4	Y	Y	T5, F2	LQFP144, TFBGA100	Flashless, on-chip HS USB PHY with OTG

Common Features

Ambient Temp Range: -40 C to 105 C

Voltage Range: 1.71–3.6 V, Flash Write Voltage: 1.71

Main OSC (Oscillator Crystal/Resonator): 32–40 KHz/8–32 MHz

HW & SW Watchdog

48 MHz IRC, High Drive GPIOs (18 mA): 8

Debug: JTAG, cJTAG, SWD, PMC, MCG, NMI

Trace: TPIU, FPB, DWT, ITM

Kinetis K1 Family of Mainstream MCUs

OVERVIEW

The Kinetis K1x MCU family, based on Arm® Cortex®-M4 core, consists of general-purpose MCUs with a variety of memory and integration options. Devices start from 32 KB of flash in a small footprint of 5 x 5 mm 32-pin QFN package extending up to 1 MB in a 144-pin MAPBGA package with an optional rich suite of analog, communication, timing and control peripherals. Additionally, its pin compatibility, flexible low-power capabilities and innovative flex memory help to solve many of the major pain points for embedded designers. For more information about the Kinetis K1x MCU family, [click here](#).

TARGET APPLICATIONS:

Barcode scanners, electronic point-of-sales (EPoS) terminals, flow meters, gaming controllers, HVAC systems, home and building automation, remote sensors

KINETIS K1X MAINSTREAM MCUs

Product	CPU	Memory	Analog	Communications					Security		
	Arm Cortex-M4			UART	I ² C	SPI	I ² S	CAN	RNG	mmCAU	Anti-tamper
K12 Mainstream	50 MHz	192 - 512 KB Flash 32 - 64 KB SRAM	1x 16-bit ADC 1x 12-bit DAC	4*	2*	2*	1				
K11 Security	50 MHz	192 - 512 KB Flash 32 - 64 KB SRAM	1x 16-bit ADC 1x 12-bit DAC*	4	2	2	1		Y	Y	Y
K10 Mixed Signal	120 MHz w/ FPU	1 MB Flash 128 KB SRAM External bus interface NAND Controller	4x PGA 4x 16-bit ADC 2x 12-bit DAC 2	6	2	3	2	2			
	100 MHz	128 - 512 KB Flash 32 - 128 KB SRAM External bus interface	2x PGA 2x 16-bit ADC 2x 12-bit DAC	6*	2	3*	1	2			
	72 MHz	96 - 288 KB Flash 16 - 64 KB SRAM External bus interface	2x PGA 2x 16-bit ADC 1x 12-bit DAC	5*	2	2*	1	1			
	50 MHz	32 - 160 KB Flash 8 - 16 KB SRAM	1x 16-bit ADC	3	1	5*	1				

*Feature only supported by a subset family

SUB-FAMILY K10: MAINSTREAM MCU WITH MIXED-SIGNAL INTEGRATION

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	Cache (KB)	DMA	Pin Count	Package	Total GPIOs	5V I/O Tolerant	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Enhanced SDHC (bit)	NAND Flash Controller	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Evaluation Board (See Page 17)	
	MK10DN128VFM5	50	-	-	-	4ch	32	QFN	24	-	128	128	-	-	16	3	1	1	1	4	1	1	-	-	-	1x8ch	1x2ch	-	10ch	-	-	2	2/2	-	T1	
	MK10DN128VFT5	50	-	-	-	4ch	48	QFN	33	-	128	128	-	-	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DN128VLF5	50	-	-	-	4ch	48	LQFP	33	-	128	128	-	-	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DN128VLH5	50	-	-	-	4ch	64	LQFP	44	-	128	128	-	-	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DN128VMP5	50	-	-	-	4ch	64	MAPBGA	44	-	128	128	-	-	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DN32VFM5	50	-	-	-	4ch	32	QFN	24	-	32	32	-	-	8	3	1	1	1	4	1	1	-	-	-	1x8ch	1x2ch	-	10ch	-	-	2	2/2	-	T1	
	MK10DN32VFT5	50	-	-	-	4ch	48	QFN	33	-	32	32	-	-	8	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DN32VLF5	50	-	-	-	4ch	48	LQFP	33	-	32	32	-	-	8	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DN32VLH5	50	-	-	-	4ch	64	LQFP	44	-	32	32	-	-	8	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DN32VMP5	50	-	-	-	4ch	64	MAPBGA	44	-	32	32	-	-	8	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DN64VFM5	50	-	-	-	4ch	32	QFN	24	-	64	64	-	-	16	3	1	1	1	4	1	1	-	-	-	1x8ch	1x2ch	-	10ch	-	-	2	2/2	-	T1	
	MK10DN64VFT5	50	-	-	-	4ch	48	QFN	33	-	64	64	-	-	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DN64VLF5	50	-	-	-	4ch	48	LQFP	33	-	64	64	-	-	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DN64VLH5	50	-	-	-	4ch	64	LQFP	44	-	64	64	-	-	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DN64VMP5	50	-	-	-	4ch	64	MAPBGA	44	-	64	64	-	-	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DX128VFM5	50	-	-	-	4ch	32	QFN	24	-	160	128	32	2	16	3	1	1	1	4	1	1	-	-	-	1x8ch	1x2ch	-	10ch	-	-	2	2/2	-	T1	
	MK10DX128VFT5	50	-	-	-	4ch	48	QFN	33	-	160	128	32	2	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DX128VLF5	50	-	-	-	4ch	48	LQFP	33	-	160	128	32	2	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DX128VLH5	50	-	-	-	4ch	64	LQFP	44	-	160	128	32	2	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DX128VMP5	50	-	-	-	4ch	64	MAPBGA	44	-	160	128	32	2	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DX32VFM5	50	-	-	-	4ch	32	QFN	24	-	64	32	32	2	8	3	1	1	1	4	1	1	-	-	-	1x8ch	1x2ch	-	10ch	-	-	2	2/2	-	T1	
	MK10DX32VFT5	50	-	-	-	4ch	48	QFN	33	-	64	32	32	2	8	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DX32VLF5	50	-	-	-	4ch	48	LQFP	33	-	64	32	32	2	8	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DX32VLH5	50	-	-	-	4ch	64	LQFP	44	-	64	32	32	2	8	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DX32VMP5	50	-	-	-	4ch	64	MAPBGA	44	-	64	32	32	2	8	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DX64VFM5	50	-	-	-	4ch	32	QFN	24	-	96	64	32	2	16	3	1	1	1	4	1	1	-	-	-	1x8ch	1x2ch	-	10ch	-	-	2	2/2	-	T1	
	MK10DX64VFT5	50	-	-	-	4ch	48	QFN	33	-	96	64	32	2	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DX64VLF5	50	-	-	-	4ch	48	LQFP	33	-	96	64	32	2	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	1ch	16ch	-	-	2	3/3	Y	T1	
	MK10DX64VLH5	50	-	-	-	4ch	64	LQFP	44	-	96	64	32	2	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DX64VMP5	50	-	-	-	4ch	64	MAPBGA	44	-	96	64	32	2	16	3	1	1	1	5	1	1	-	-	-	1x8ch	1x2ch	2ch	19ch	-	-	2	6/4	Y	T1	
	MK10DX128VLH7	72	-	-	-	16ch	64	LQFP	44	Y	160	128	32	2	32	3	1	1	1	5	2	1	1	-	-	-	1x8ch	2x2ch	2ch	26ch	2	1	3	6/4/2	Y	T2
	MK10DX128VLK7	72	-	-	-	16ch	80	LQFP	56	Y	160	128	32	2	32	4	1	1	2	5/3	2	1	1	-	-	-	1x8ch	2x2ch	2ch	31ch	2	1	3	6/4/2	Y	T2
	MK10DX128VLL7	72	-	-	-	16ch	100	LQFP	70	Y	160	128	32	2	32	5	1	1	2	6/4	2	1	1	-	-	-	1x8ch	2x2ch	4ch	37ch	2	1	3	6/4/2	Y	T2
	MK10DX128VMC7	72	-	-	-	16ch	121	MAPBGA	74	Y	160	128	32	2	32	5	1	1	2	6/4	2	1	1	-	-	-	1x8ch	2x2ch	4ch	39ch	2	1	3	6/4/3	Y	T2
	MK10DX256VLH7	72	-	-	-	16ch	64	LQFP	44	Y	288	256	32	2	64	3	1	1	1	5	2	1	1	-	-	-	1x8ch	2x2ch	2ch	26ch	2	1	3	6/4/2	Y	T2
	MK10DX256VLK7	72	-	-	-	16ch	80	LQFP	56	Y	288	256	32	2	64	4	1	1	2	5/3	2	1	1	-	-	-	1x8ch	2x2ch	2ch	31ch	2	1	3	6/4/2	Y	T2
	MK10DX256VLL7	72	-	-	-	16ch	100	LQFP	70	Y	288	256	32	2	64	5	1	1	2	6/4	2	1	1	-	-	-	1x8ch	2x2ch	4ch	37ch	2	1	3	6/4/2	Y	T2
	MK10DX256VMC7	72	-	-	-	16ch	121	MAPBGA	74	Y	288	256	32	2	64	5	1	1	2	6/4	2	1	1	-	-	-	1x8ch	2x2ch	4ch	39ch	2	1	3	6/4/3	Y	T2
	MK10DX64VLH7	72	-	-	-	16ch	64	LQFP	44	Y	96	64	32	2	16	3	1	1	1	5	2	1	1	-	-	-	1x8ch	2x2ch	2ch	26ch	2	1	3	6/4/2	Y	T2
	MK10DX64VLK7	72	-	-	-	16ch	80	LQFP	56	Y	96	64	32	2	16	4	1	1	2	5/3	2	1	1	-	-	-	1x8ch	2x2ch	2ch	31ch	2	1	3	6/4/2	Y	T2
	MK10DX64VMC7	72	-	-	-	16ch	121	MAPBGA	74	Y	96	64	32	2	16	5	1	1	2	6/4	2	1	1	-	-	-	1x8ch	2x2ch	4ch	39ch	2	1	3	6/4/2	Y	T2
[1]	MK10DN512VLK10	100	-	Y	-	16ch	80	LQFP	56	Y	512	512	-	-	128	4	1	1	2	5/3	2	1	2	4	-	-	1x8ch	2x2ch	2ch	31ch	2	1	3	6/4/2	Y	T9
[1]	MK10DN512VLL10	100	-	Y	-	16ch	100	LQFP	70	Y	512	512	-	-	128	5	1	1	3	6/4/1	2	1	2	4	-	-	1x8ch	2x2ch	4ch	37ch	2	1	3	6/td		

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	Cache (KB)	DMA	Pin Count	Package	Total GPIOs	5V I/O Tolerant	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Enhanced SDHC (bit)	NAND Flash Controller	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Evaluation Board (See Page 17)
[1]	MK10DN512VMD10	100	-	Y	-	16ch	144	MAPBGA	104	Y	512	512	-	-	128	6	1	1	3	6/4/2	2	1	2	8	-	1x8ch	2x2ch	4ch	46ch	2	2	3	6/5/4	Y	T9
[1]	MK10DX128VLQ10	100	-	Y	-	16ch	144	LQFP	104	Y	256	128	128	4	32	6	1	1	3	6/4/2	2	1	2	8	-	1x8ch	2x2ch	4ch	46ch	2	2	3	6/5/4	Y	T9
[1]	MK10DX128VMD10	100	-	Y	-	16ch	144	MAPBGA	104	Y	256	128	128	4	32	6	1	1	3	6/4/2	2	1	2	8	-	1x8ch	2x2ch	4ch	46ch	2	2	3	6/5/4	Y	T9
[1]	MK10DX256VLQ10	100	-	Y	-	16ch	144	LQFP	104	Y	512	256	256	4	64	6	1	1	3	6/4/2	2	1	2	8	-	1x8ch	2x2ch	4ch	46ch	2	2	3	6/5/4	Y	T9
[1]	MK10DX256VMD10	100	-	Y	-	16ch	144	MAPBGA	104	Y	512	256	256	4	64	6	1	1	3	6/4/2	2	1	2	8	-	1x8ch	2x2ch	4ch	46ch	2	2	3	6/5/4	Y	T9
[1,2]	MK10FN1M0VLQ12	120	Y	Y	16	32ch	144	LQFP	104	Y	1024	1024	-	-	128	6	2	-	3	6/4/2	2	2	2	8	Y	2x8ch	2x2ch	4ch	62ch	4	2	4	5/2/2/5	Y	T10
[1,2]	MK10FN1M0VMD12	120	Y	Y	16	32ch	144	MAPBGA	104	Y	1024	1024	-	-	128	6	2	-	3	6/4/2	2	2	2	8	Y	2x8ch	2x2ch	4ch	62ch	4	2	4	5/2/2/5	Y	T10
[1,2]	MK10FX512VLQ12	120	Y	Y	16	32ch	144	LQFP	104	Y	1024	512	512	16	128	6	2	-	3	6/4/2	2	2	2	8	Y	2x8ch	2x2ch	4ch	62ch	4	2	4	5/2/2/5	Y	T10
[1,2]	MK10FX512VMD12	120	Y	Y	16	32ch	144	MAPBGA	104	Y	1024	512	512	16	128	6	2	-	3	6/4/2	2	2	2	8	Y	2x8ch	2x2ch	4ch	62ch	4	2	4	5/2/2/5	Y	T10

Common Features

Ambient Temp Range: -40 C to 105 C

Voltage Range: 1.71–3.6 V

Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/8–32 MHz

Debug: JTAG, cJTAG, SWD

RTC (32 KHz OSC, Vbat)

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16ch

2x FTM External Clk, 1x Low Power Timer, 1x PDB

Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP

Serial Programming Interface, CMT (Carrier Module Transmitter)

Trace: TPIU, FPB, DWT, ITM

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

[2] Secondary OSC: 32–40 KHz/8–32 MHz

K11 SUB-FAMILY: MAINSTREAM MCU WITH TAMPER DETECTION

Footnotes	Part Number	CPU Frequency	DMA	Pin Count	Package	GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	SPI Module	SPI + Chip Selects	I ² C	I ² S	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Tamper Detect (DryIce)	Number of External Tamper Pins	Evaluation Board (See Page 17)	
	MK11DN512AVLK5	50 MHz	16ch	80	LQFP	60	512	512	-	-	64	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	-	2	5/4	-	Y	Y	Y	Y	2	T3
	MK11DN512AVMC5	50 MHz	16ch	121	MAPBGA	64	512	512	-	-	64	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	5/4	Y	Y	Y	Y	3	T3	
	MK11DN512VLK5	50 MHz	16ch	80	LQFP	60	512	512	-	-	64	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	-	2	5/4	-	Y	Y	Y	Y	2	T3
	MK11DN512VMC5	50 MHz	16ch	121	MAPBGA	64	512	512	-	-	64	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	5/4	Y	Y	Y	Y	3	T3	
	MK11DX128AVLK5	50 MHz	16ch	80	LQFP	60	192	128	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	-	2	5/4	-	Y	Y	Y	Y	2	T3
	MK11DX128AVMC5	50 MHz	16ch	121	MAPBGA	64	192	128	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	5/4	Y	Y	Y	Y	3	T3	
	MK11DX128VLK5	50 MHz	16ch	80	LQFP	60	192	128	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	-	2	5/4	-	Y	Y	Y	Y	2	T4
	MK11DX128VMC5	50 MHz	16ch	121	MAPBGA	64	192	128	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	5/4	Y	Y	Y	Y	3	T5	
	MK11DX256AVLK5	50 MHz	16ch	80	LQFP	60	320	256	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	-	2	5/4	-	Y	Y	Y	Y	2	T6
	MK11DX256AVMC5	50 MHz	16ch	121	MAPBGA	64	320	256	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	5/4	Y	Y	Y	Y	3	T7	
	MK11DX256VLK5	50 MHz	16ch	80	LQFP	60	320	256	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	-	2	5/4	-	Y	Y	Y	Y	2	T8
	MK11DX256VMC5	50 MHz	16ch	121	MAPBGA	64	320	256	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	5/4	Y	Y	Y	Y	3	T9	

Common Features

Ambient Temp Range: -40 C to 105 C

Voltage Range: 1.71–3.6 V, Flash Write Voltage: 1.71

Main OSC (Oscillator Crystal/Resonator): 32–40 KHz/8–32 MHz

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block

PIT (32 bit): 1x4ch

Debug: JTAG, cJTAG, SWD, RTC (32 KHz OSC, Vbat)

Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP Serial Programming Interface, CMT (Carrier Module Transmitter)

Hardware Encryption and Tamper Detect

Trace: TPIU, FPB, DWT, ITM, ETM

K12 SUB-FAMILY: MAINSTREAM MCU WITH OPTIMIZED FEATURES

Footnotes	Part Number	CPU Frequency	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	SPI Module	SPI + Chip Selects	I ² C	I ² S	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator	Vref	Evaluation Board (See Page 17)
	MK12DN512VLH5	50 MHz	16ch	64	LQFP	44	512	512	-	-	64	3	1	1	1	5	2	1	1x8ch + 1x2ch	1x2ch	2ch	22ch	1	2	4/2	Y	T3
	MK12DN512VLK5	50 MHz	16ch	80	LQFP	60	512	512	-	-	64	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	4/2	Y	T3
	MK12DN512VMC5	50 MHz	16ch	121	MAPBGA	60	512	512	-	-	64	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	4/2	Y	T3
	MK12DX128VLF5	50 MHz	16ch	48	LQFP	33	192	128	64	4	32	3	1	1	1	5	1	1	1x8ch	1x2ch	1ch	18ch	-	2	2/2	Y	T3
	MK12DX128VLH5	50 MHz	16ch	64	LQFP	44	192	128	64	4	32	3	1	1	1	5	2	1	1x8ch + 1x2ch	1x2ch	2ch	22ch	1	2	4/2	Y	T3
	MK12DX128VLK5	50 MHz	16ch	80	LQFP	60	192	128	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	4/2	Y	T3
	MK12DX128VMC5	50 MHz	16ch	121	MAPBGA	60	192	128	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	4/2	Y	T3
	MK12DX256VLF5	50 MHz	16ch	48	LQFP	33	320	256	64	4	32	3	1	1	1	5	1	1	1x8ch	1x2ch	1ch	18ch	-	2	2/2	Y	T3
	MK12DX256VLH5	50 MHz	16ch	64	LQFP	44	320	256	64	4	32	3	1	1	1	5	2	1	1x8ch + 1x2ch	1x2ch	2ch	22ch	1	2	4/2	Y	T3
	MK12DX256VLK5	50 MHz	16ch	80	LQFP	60	320	256	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	4/2	Y	T3
	MK12DX256VMC5	50 MHz	16ch	121	MAPBGA	60	320	256	64	4	32	4	1	1	2	5/3	2	1	1x8ch + 1x2ch	1x2ch	3ch	24ch	1	2	4/2	Y	T3

Common Features

Ambient Temp Range: -40 C to 105 C

Voltage Range: 1.71–3.6 V, Flash Write Voltage: 1.71

Main OSC (Oscillator Crystal/Resonator): 32–40 KHz/8–32 MHz

Debug: JTAG, cJTAG, SWD, RTC (32 KHz OSC, Vbat)

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block

PIT (32 bit): 1x4ch

Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP Serial Programming Interface, CMT (Carrier Module Transmitter)

Trace: TPIU, FPB, DWT, ITM, ETM

Kinetis K2x Family of USB MCUs

OVERVIEW

The Kinetis K2x MCU family, based on the Arm® Cortex®-M4 core, is pin, peripheral and software compatible with many of the Kinetis K series MCU families, offering full and high-speed USB 2.0 On-The-Go options, in addition to other features like device charge detect capability and USB crystal-less functionality. This family starts from 32 KB of flash in a 5 x 5 mm 32-pin QFN package extending up to 1 MB in a 144-pin MAPBGA package with up to 256 KB of SRAM. For more information about the Kinetis K2x MCU family, [click here](#).

TARGET APPLICATIONS:

Barcode scanners, electronic point-of-sales (EPoS) terminals, gaming accessories, health and wellness monitors, home and building automation, industrial/commercial sensor nodes, IoT data concentrators, multi-functional printers, smart grid data concentrators, sports and activity wearables

KINETIS K2x MCU FAMILIES

Kinetis K2x USB MCUs							
	CPU, Arm® Cortex®-M4	Memory	Communications		Security		
			USB Controllers	CAN	RNG	Symmetric Crypto Accelerator	Anti-Tamper
K28 Dual USBs, large memory and PMC w/core voltage bypass	150 MHz w/FPU	2 MB flash, 1 MB SRAM, SDRAM controller, QuadSPI interface	2 x full-speed crystal-less + high-speed w/ HS PHY	–	Yes	Yes	–
K27 Dual USBs and large memory	150 MHz w/FPU	2 MB flash, 1 MB SRAM, SDRAM controller, QuadSPI interface	2 x full-speed crystal-less + high-speed w/HS PHY	–	Yes	Yes	–
K26 Dual USBs and high performance	180 MHz w/FPU	2 MB flash, 256 KB SRAM, SDRAM controller	2 x full-speed crystal-less + high-speed w/HS PHY	2	Yes	Yes	–
K24 Cost-effective and 256 KB SRAM	120 MHz w/FPU	1 MB flash, 256 KB, 256 KB SRAM	1 x full-speed	1*	Yes	Yes	–
K22 Cost-effective	120 MHz w/FPU	640–1024 KB flash, 128 KB SRAM	1 x full-speed	1	–	–	–
	120 MHz w/FPU	128 KB–1 MB flash, 48–128 KB SRAM	1 x full-speed crystal-less	–	Yes	–	–
	100 MHz w/FPU	128 KB flash, 24 KB SRAM	1 x full-speed	–	–	–	–
	50 MHz	192–512 KB flash, 32–64 KB SRAM	1 x full-speed	–	–	–	–
K21 Advanced security	120 MHz w/FPU	640 KB–1 MB flash, 128 KB SRAM	1 x full-speed	1*	Yes	Yes	Yes
	50 MHz	192–512 KB flash, 32–64 KB SRAM	1 x full-speed	1*	Yes	Yes	Yes
K20 High mixed-signal integration	120 MHz w/FPU	512 KB–1 MB flash, 128 KB SRAM, NAND controller	2 x full-speed + high-speed	2*	–	–	–
	100 MHz	256–512 KB flash, 32–128 KB SRAM	1 x full-speed	2*	–	–	–
	72 MHz	96–288 KB flash, 16–64 KB SRAM	1 x full-speed	2*	–	–	–
	50 MHz	32–160 KB flash, 8–16 KB SRAM	1 x full-speed	2*	–	–	–

*Feature only supported by a subset family

RNG: Random Number Generator

FPU: Floating Point Unit

K20 SUB-FAMILY: MCUs WITH FULL-SPEED USB AND MIXED-SIGNAL INTEGRATION

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	5V I/O Tolerant	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	NAND Controller	USB Controllers	USB Full-Speed+PHY	USB High-Speed (no PHY)	SPI Modules	SPI+Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Touch Sensing Inputs	Evaluation Board (See Page 17)
	MK20DN128VFM5	50	–	–	4ch	32	QFN	20	–	128	128	–	–	16	2	1	1	–	–	1	Y	–	1	4	1	1	–	1x8ch	1x2ch	–	6ch	–	–	2	2/2	–	16	T1
	MK20DN128VFT5	50	–	–	4ch	48	QFN	29	–	128	128	–	–	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DN128VLF5	50	–	–	4ch	48	LQFP	29	–	128	128	–	–	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DN128VLH5	50	–	–	4ch	64	LQFP	40	–	128	128	–	–	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DN128VMP5	50	–	–	4ch	64	MAPBGA	40	–	128	128	–	–	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DN32VFM5	50	–	–	4ch	32	QFN	20	–	32	32	–	–	8	2	1	1	–	–	1	Y	–	1	4	1	1	–	1x8ch	1x2ch	–	6ch	–	–	2	2/2	–	16	T1
	MK20DN32VFT5	50	–	–	4ch	48	QFN	29	–	32	32	–	–	8	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DN32VLF5	50	–	–	4ch	48	LQFP	29	–	32	32	–	–	8	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DN32VLH5	50	–	–	4ch	64	LQFP	40	–	32	32	–	–	8	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DN32VMP5	50	–	–	4ch	64	MAPBGA	40	–	32	32	–	–	8	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DN64VFM5	50	–	–	4ch	32	QFN	20	–	64	64	–	–	16	2	1	1	–	–	1	Y	–	1	4	1	1	–	1x8ch	1x2ch	–	6ch	–	–	2	2/2	–	16	T1
	MK20DN64VFT5	50	–	–	4ch	48	QFN	29	–	64	64	–	–	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DN64VLF5	50	–	–	4ch	48	LQFP	29	–	64	64	–	–	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DN64VLH5	50	–	–	4ch	64	LQFP	40	–	64	64	–	–	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DN64VMP5	50	–	–	4ch	64	MAPBGA	40	–	64	64	–	–	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DX128VFM5	50	–	–	4ch	32	QFN	20	–	160	128	32	2	16	2	1	1	–	–	1	Y	–	1	4	1	1	–	1x8ch	1x2ch	–	6ch	–	–	2	2/2	–	16	T1
	MK20DX128VFT5	50	–	–	4ch	48	QFN	29	–	160	128	32	2	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DX128VLF5	50	–	–	4ch	48	LQFP	29	–	160	128	32	2	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DX128VLH5	50	–	–	4ch	64	LQFP	40	–	160	128	32	2	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DX128VMP5	50	–	–	4ch	64	MAPBGA	40	–	160	128	32	2	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DX32VFM5	50	–	–	4ch	32	QFN	20	–	64	32	32	2	8	2	1	1	–	–	1	Y	–	1	4	1	1	–	1x8ch	1x2ch	–	6ch	–	–	2	2/2	–	16	T1
	MK20DX32VFT5	50	–	–	4ch	48	QFN	29	–	64	32	32	2	8	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DX32VLF5	50	–	–	4ch	48	LQFP	29	–	64	32	32	2	8	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DX32VLH5	50	–	–	4ch	64	LQFP	40	–	64	32	32	2	8	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DX32VMP5	50	–	–	4ch	64	MAPBGA	40	–	64	32	32	2	8	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DX64VFM5	50	–	–	4ch	32	QFN	20	–	96	64	32	2	16	2	1	1	–	–	1	Y	–	1	4	1	1	–	1x8ch	1x2ch	–	6ch	–	–	2	2/2	–	16	T1
	MK20DX64VFT5	50	–	–	4ch	48	QFN	29	–	96	64	32	2	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DX64VLF5	50	–	–	4ch	48	LQFP	29	–	96	64	32	2	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	1ch	12ch	–	–	2	3/3	Y	14	T1
	MK20DX64VLH5	50	–	–	4ch	64	LQFP	40	–	96	64	32	2	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DX64VMP5	50	–	–	4ch	64	MAPBGA	40	–	96	64	32	2	16	3	1	1	–	–	1	Y	–	1	5	1	1	–	1x8ch	1x2ch	2ch	15ch	–	–	2	6/4	Y	16	T1
	MK20DX128VLH7	72	–	–	16ch	64	LQFP	40	Y	160	128	32	2	32	3	1	1	–	–	1	Y	–	1	5	2	1	1	1x8ch	2x2ch	2ch	22ch	2	1	3	6/4/2	Y	16	T2
	MK20DX128VLK7	72	–	–	16ch	80	LQFP	52	Y	160	128	32	2	32	4	1	1	–	–	1	Y	–	2	5/3	2	1	1	1x8ch	2x2ch	2ch	27ch	2	1	3	6/4/2	Y	16	T2
	MK20DX128VLL7	72	–	–	16ch	100	LQFP	66	Y	160	128	32	2	32	5	1	1	–	–	1	Y	–	2	6/4	2	1	1	1x8ch	2x2ch	4ch	33ch	2	1	3	6/4/2	Y	16	T2
	MK20DX128VMC7	72	–	–	16ch	121	MAPBGA	70	Y	160	128	32	2	32	5	1	1	–	–	1	Y	–	2	6/4	2	1	1	1x8ch	2x2ch	4ch	35ch	2	1	3	6/4/3	Y	16	T2
	MK20DX256VLH7	72	–	–	16ch	64	LQFP	40	Y	288	256	32	2	64	3	1	1	–	–	1	Y	–	1	5	2	1	1	1x8ch	2x2ch	2ch	22ch	2	1	3	6/4/2	Y	16	T2
	MK20DX256VLK7	72	–	–	16ch	80	LQFP	52	Y	288	256	32	2	64	4	1	1	–	–	1	Y	–	2	5/3	2	1	1	1x8ch	2x2ch	2ch	27ch	2	1	3	6/4/2	Y	16	T2
	MK20DX256VLL7	72	–	–	16ch	100	LQFP	66	Y	288	256	32	2	64	5	1	1	–	–	1	Y	–	2	6/4	2	1	1	1x8ch	2x2ch	4ch	33ch	2	1	3	6/4/2	Y	16	T2
	MK20DX256VMC7	72	–	–	16ch	121	MAPBGA	70	Y	288	256	32	2	64	5	1	1	–	–	1	Y	–	2	6/4	2	1	1	1x8ch	2x2ch	4ch	35ch	2	1	3	6/4/3	Y	16	T2

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	5V I/O Tolerant	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	NAND Controller	USB Controllers	USB Full-Speed+PHY	USB High-Speed (no PHY)	SPI Modules	SPI+Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Touch Sensing Inputs	Evaluation Board (See Page 17)
	MK20DX64VLH7	72	–	–	16ch	64	LQFP	40	Y	96	64	32	2	16	3	1	1	–	–	1	Y	–	1	5	2	1	1	1x8ch	2x2ch	2ch	22ch	2	1	3	6/4/2	Y	16	T2
	MK20DX64VLK7	72	–	–	16ch	80	LQFP	52	Y	96	64	32	2	16	4	1	1	–	–	1	Y	–	2	5/3	2	1	1	1x8ch	2x2ch	2ch	27ch	2	1	3	6/4/2	Y	16	T2
	MK20DX64VMC7	72	–	–	16ch	121	MAPBGA	70	Y	96	64	32	2	16	5	1	1	–	–	1	Y	–	2	6/4	2	1	1	1x8ch	2x2ch	4ch	35ch	2	1	3	6/4/3	Y	16	T2
[1]	MK20DN512VLK10	100	–	Y	16ch	80	LQFP	52	Y	512	512	–	–	128	4	1	1	4	–	1	Y	–	2	5/3	2	1	2	1x8ch	2x2ch	2ch	27ch	2	1	3	6/4/2	Y	16	T9
[1]	MK20DN512VLL10	100	–	Y	16ch	100	LQFP	66	Y	512	512	–	–	128	5	1	1	4	–	1	Y	–	3	6/4/1	2	1	2	1x8ch	2x2ch	4ch	33ch	2	1	3	6/4/2	Y	16	T9
[1]	MK20DN512VLQ10	100	–	Y	16ch	144	LQFP	100	Y	512	512	–	–	128	6	1	1	8	–	1	Y	–	3	6/4/2	2	1	2	1x8ch	2x2ch	4ch	42ch	2	2	3	6/5/4	Y	16	T9
[1]	MK20DN512VMC10	100	–	Y	16ch	121	MAPBGA	86	Y	512	512	–	–	128	6	1	1	8	–	1	Y	–	3	6/4/2	2	1	2	1x8ch	2x2ch	4ch	38ch	2	2	3	6/4/3	Y	16	T9
[1]	MK20DN512VMD10	100	–	Y	16ch	144	MAPBGA	100	Y	512	512	–	–	128	6	1	1	8	–	1	Y	–	3	6/4/2	2	1	2	1x8ch	2x2ch	4ch	42ch	2	2	3	6/5/4	Y	16	T9
[1,3]	MK20DN512ZCAB10R	100	–	Y	16ch	120	WLCSP	79	Y	512	512	–	–	128	6	1	1	4	–	1	Y	–	3	6/4/1	2	1	2	1x8ch	2x2ch	4ch	38ch	2	2	3	6/5/3	Y	16	T9
[1]	MK20DX128VLQ10	100	–	Y	16ch	144	LQFP	100	Y	256	128	128	4	32	6	1	1	8	–	1	Y	–	3	6/4/2	2	1	2	1x8ch	2x2ch	4ch	42ch	2	2	3	6/5/4	Y	16	T9
[1]	MK20DX256VLK10	100	–	Y	16ch	80	LQFP	52	Y	512	256	256	4	64	4	1	1	4	–	1	Y	–	2	5/3	2	1	2	1x8ch	2x2ch	2ch	27ch	2	1	3	6/4/2	Y	16	T9
[1]	MK20DX256VLQ10	100	–	Y	16ch	144	LQFP	100	Y	512	256	256	4	64	6	1	1	8	–	1	Y	–	3	6/4/2	2	1	2	1x8ch	2x2ch	4ch	42ch	2	2	3	6/5/4	Y	16	T9
[1]	MK20DX256VMC10	100	–	Y	16ch	121	MAPBGA	86	Y	512	256	256	4	64	6	1	1	8	–	1	Y	–	3	6/4/2	2	1	2	1x8ch	2x2ch	4ch	38ch	2	2	3	6/4/3	Y	16	T9
[1]	MK20DX256VMD10	100	–	Y	16ch	144	MAPBGA	100	Y	512	256	256	4	64	6	1	1	8	–	1	Y	–	3	6/4/2	2	1	2	1x8ch	2x2ch	4ch	42ch	2	2	3	6/5/4	Y	16	T9
[1]	MK20DX256VLL10	100	–	Y	16ch	100	LQFP	66	Y	512	256	256	4	64	5	1	1	4	–	1	Y	–	3	6/4/1	2	1	2	1x8ch	2x2ch	4ch	33ch	2	1	3	6/4/2	Y	16	T9
[1,2]	MK20FN1M0VLQ12	120	Y	Y	32ch	144	LQFP	100	Y	1024	1024	–	–	128	6	2	0	8	Y	2	Y	Y	3	6/4/2	2	2	2	2x8ch	2x2ch	4ch	58ch	4	2	4	5/2/2/5	Y	16	T10
[1,2]	MK20FN1M0VMD12	120	Y	Y	32ch	144	MAPBGA	100	Y	1024	1024	–	–	128	6	2	0	8	Y	2	Y	Y	3	6/4/2	2	2	2	2x8ch	2x2ch	4ch	58ch	4	2	4	5/2/2/5	Y	16	T10
[1,2]	MK20FX512VLQ12	120	Y	Y	32ch	144	LQFP	100	Y	1024	512	512	16	128	6	2	0	8	Y	2	Y	Y	3	6/4/2	2	2	2	2x8ch	2x2ch	4ch	58ch	4	2	4	5/2/2/5	Y	16	T10
[1,2]	MK20FX512VMD12	120	Y	Y	32ch	144	MAPBGA	100	Y	1024	512	512	16	128	6	2	0	8	Y	2	Y	Y	3	6/4/2	2	2	2	2x8ch	2x2ch	4ch	58ch	4	2	4	5/2/2/5	Y	16	T10
[1,2]	MK20FX512VMD12	120	MAPBGA	1MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	16	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	Y	Y	32ch	Y	100	T10				

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat)
Trace: TPIU, FPB, DWT, ITM

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
PIT (32 bit): 1x4ch
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB Device Charge Detect, USB 120 mAREg

Footnotes

- [1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB
- [2] Cache: 16 KB
- [2] Secondary OSC: 32–40 KHz/8–32 MHz
- [3] Temp Range: -40 C to 85 C

K21 SUB-FAMILY: MCUs WITH FULL-SPEED USB AND TAMPER DETECTION

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	5V I/O Tolerant	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	USB Controllers	USB Full-Speed+PHY	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Module	SPI+Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)	
	MK21DN512AVLK5	50	–	–	16ch	80	LQFP	56	–	512	512	–	–	64	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	–	2	5/4	–	Y	Y	Y	Y	2	T3
	MK21DN512AVMC5	50	–	–	16ch	121	MAPBGA	64	–	512	512	–	–	64	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	1	2	5/4	–	Y	Y	Y	Y	3	T3
	MK21DN512VLK5	50	–	–	16ch	80	LQFP	56	–	512	512	–	–	64	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	–	2	5/4	–	Y	Y	Y	Y	2	T3
	MK21DN512VMC5	50	–	–	16ch	121	MAPBGA	64	–	512	512	–	–	64	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	1	2	5/4	–	Y	Y	Y	Y	3	T3
	MK21DX128AVLK5	50	–	–	16ch	80	LQFP	56	–	192	128	64	4	32	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	–	2	5/4	–	Y	Y	Y	Y	2	T3
	MK21DX128AVMC5	50	–	–	16ch	121	MAPBGA	64	–	192	128	64	4	32	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	1	2	5/4	–	Y	Y	Y	Y	3	T3
	MK21DX128VLK5	50	–	–	16ch	80	LQFP	56	–	192	128	64	4	32	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	–	2	5/4	–	Y	Y	Y	Y	2	T3
	MK21DX128VMC5	50	–	–	16ch	121	MAPBGA	64	–	192	128	64	4	32	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	1	2	5/4	–	Y	Y	Y	Y	3	T3
	MK21DX256AVLK5	50	–	–	16ch	80	LQFP	56	–	320	256	64	4	32	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	–	2	5/4	–	Y	Y	Y	Y	2	T3
	MK21DX256AVMC5	50	–	–	16ch	121	MAPBGA	64	–	320	256	64	4	32	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	1	2	5/4	–	Y	Y	Y	Y	3	T3
	MK21DX256VLK5	50	–	–	16ch	80	LQFP	56	–	320	256	64	4	32	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	–	2	5/4	–	Y	Y	Y	Y	2	T3
	MK21DX256VMC5	50	–	–	16ch	121	MAPBGA	64	–	320	256	64	4	32	1	Y	4	1	1	–	2	5/3	2	1	–	1x8ch + 1x2ch	1x2ch	3ch	20ch	1	2	5/4	–	Y	Y	Y	Y	3	T3
[1]	MK21FN1M0AVLQ12	120	Y	Y	16ch	144	LQFP	100	Y	1024	1024	–	–	128	1	Y	6	1	1	8	3	6/4/2	3	1	1	1x8ch	2x2ch	4ch	42ch	2	3	6/5/4	Y	Y	Y	Y	Y	6	T4
[1]	MK21FN1M0AVMC12	120	Y	Y	16ch	121	MAPBGA	81	Y	1024	1024	–	–	128	1	Y	5	1	1	8	3	6/4/2	3	1	1	1x8ch	2x2ch	4ch	40ch	2	3	6/4/3	Y	Y	Y	Y	Y	6	T4
[1]	MK21FN1M0AVMD12	120	Y	Y	16ch	144	MAPBGA	95	Y	1024	1024	–	–	128	1	Y	6	1	1	8	3	6/4/2	3	1	1	1x8ch	2x2ch	4ch	42ch	2	3	6/5/4	–	Y	Y	Y	Y	3	T4
[1]	MK21FX512AVLQ12	120	Y	Y	16ch	144	LQFP	100	Y	640	512	128	4	128	1	Y	6	1	1	8	3	6/4/2	3	1	1	1x8ch	2x2ch	4ch	42ch	2	3	6/5/4	Y	Y	Y	Y	Y	6	T4
[1]	MK21FX512AVMC12	120	Y	Y	16ch	121	MAPBGA	81	Y	640	512	128	4	128	1	Y	5	1	1	8	3	6/4/2	3	1	1	1x8ch	2x2ch	4ch	40ch	2	3	6/4/3	Y	Y	Y	Y	Y	6	T4
[1]	MK21FX512AVMD12	120	Y	Y	16ch	144	MAPBGA	95	Y	640	512	128	4	128	1	Y	6	1	1	8	3	6/4/2	3	1	1	1x8ch	2x2ch	4ch	42ch	2	3	6/5/4	–	Y	Y	Y	Y	3	T4

Common Features

Ambient Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat)

Trace: TPIU, FPB, DWT, ITM, ETM
PIT (32 bit): 1x4ch
2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB Device Charge Detect, USB 120 mAReg

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

K22 SUB-FAMILY: COST EFFECTIVE MCUs WITH USB FULL-SPEED

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	USB Full-Speed Controllers + PHY	USB FS Crystal-less Operations	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI+ Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Evaluation Board (See Page 17)
[1,2]	MK22DN512VLH5	50	-	-	16ch	64	LQFP	40	512	512	-	-	64	1	-	3	1	1	-	1	5	2	1	-	1x8ch + 1x2ch		2	18	1	2	4/2	Y	-	T3
[1,2]	MK22DN512VLK5	50	-	-	16ch	80	LQFP	56	512	512	-	-	64	1	-	4	1	1	-	2	5/3	2	1	-	1x8ch + 1x2ch	1x2ch	3	20	1	2	4/2	Y	-	T3
[1,2]	MK22DN512VMC5	50	-	-	16ch	121	MAPBGA	56	512	512	-	-	64	1	-	4	1	1	-	2	5/3	2	1	-	1x8ch + 1x2ch	1x2ch	3	20	1	2	4/2	Y	-	T3
[1,2]	MK22DX128VLF5	50	-	-	16ch	48	LQFP	29	192	128	64	4	32	1	-	3	1	1	-	1	5	1	1	-	1x8ch + 1x2ch	1x2ch	1	14	-	2	2/2	Y	-	T3
[1,2]	MK22DX128VLH5	50	-	-	16ch	64	LQFP	40	192	128	64	4	32	1	-	3	1	1	-	1	5	2	1	-	1x8ch + 1x2ch	1x2ch	2	18	1	2	4/2	Y	-	T3
[1,2]	MK22DX128VLK5	50	-	-	16ch	80	LQFP	56	192	128	64	4	32	1	-	4	1	1	-	2	5/3	2	1	-	1x8ch + 1x2ch	1x2ch	3	20	1	2	4/2	Y	-	T3
[1,2]	MK22DX128VMC5	50	-	-	16ch	121	MAPBGA	56	192	128	64	4	32	1	-	4	1	1	-	2	5/3	2	1	-	1x8ch + 1x2ch	1x2ch	3	20	1	2	4/2	Y	-	T3
[1,2]	MK22DX256VLF5	50	-	-	16ch	48	LQFP	29	320	256	64	4	32	1	-	3	1	1	-	1	5	1	1	-	1x8ch + 1x2ch	1x2ch	1	14	-	2	2/2	Y	-	T3
[1,2]	MK22DX256VLH5	50	-	-	16ch	64	LQFP	40	320	256	64	4	32	1	-	3	1	1	-	1	5	2	1	-	1x8ch + 1x2ch	1x2ch	2	18	1	2	4/2	Y	-	T3
[1,2]	MK22DX256VLK5	50	-	-	16ch	80	LQFP	56	320	256	64	4	32	1	-	4	1	1	-	2	5/3	2	1	-	1x8ch + 1x2ch	1x2ch	3	20	1	2	4/2	Y	-	T3
[1,2]	MK22DX256VMC5	50	-	-	16ch	121	MAPBGA	56	320	256	64	4	32	1	-	4	1	1	-	2	5/3	2	1	-	1x8ch + 1x2ch	1x2ch	3	20	1	2	4/2	Y	-	T3
[4]	MK22FN128CAH12R	120	Y	-	16ch	64	WLCSP	40	128	128	-	-	48	1	Y	4	1	1	-	2	5/2	2	1	-	1x8ch	2x2ch	2	22	1	2	5/4	Y	Y	T5
[4]	MK22FN128VDC10	100	Y	-	4 ch	121	XFPGA	67	128	128	-	-	24	1	Y	4	1	1	-	2	6/4	2	1	-	1x8ch	2x2ch	4	34	1	2	6/4	Y	-	T5,F2
[4]	MK22FN128VLH10	100	Y	-	4 ch	64	LQFP	40	128	128	-	-	24	1	Y	4	1	1	-	2	5/2	2	1	-	1x8ch	2x2ch	2	22	1	2	5/4	Y	-	T5,F2
[4]	MK22FN128VLL10	100	Y	-	4 ch	100	LQFP	66	128	128	-	-	24	1	Y	4	1	1	-	2	6/4	2	1	-	1x8ch	2x2ch	4	33	1	2	5/4	Y	-	T5,F2
[4]	MK22FN128VMP10	100	Y	-	4 ch	64	MAPBGA	40	128	128	-	-	24	1	Y	4	1	1	-	2	5/2	2	1	-	1x8ch	2x2ch	2	22	1	2	5/4	Y	-	T5,F2
[1,3]	MK22FN1M0AVLH12	120	Y	Y	16ch	64	LQFP	40	1024	1024	-	-	128	1	-	3	1	1	-	1	5	3	1	1	2x8ch	2x2ch	2	22	1	3	6/4/2	Y	-	T4
[1,3]	MK22FN1M0AVLK12	120	Y	Y	16ch	80	LQFP	52	1024	1024	-	-	128	1	-	4	1	1	8	2	5/3	3	1	1	2x8ch	2x2ch	3	27	1	3	6/4/2	Y	-	T4
[1,3]	MK22FN1M0AVLL12	120	Y	Y	16ch	100	LQFP	66	1024	1024	-	-	128	1	-	5	1	1	8	3	6/4/1	3	1	1	2x8ch	2x2ch	5	33	1	3	6/4/2	Y	-	T4
[1,3]	MK22FN1M0AVLQ12	120	Y	Y	16ch	144	LQFP	100	1024	1024	-	-	128	1	-	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	5	42	2	3	6/5/4	Y	-	T4
[1,3]	MK22FN1M0AVMC12	120	Y	Y	16ch	121	MAPBGA	86	1024	1024	-	-	128	1	-	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	5	38	2	3	6/5/4	Y	-	T4
[1,3]	MK22FN1M0AVMD12	120	Y	Y	16ch	144	MAPBGA	100	1024	1024	-	-	128	1	-	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	5	42	2	3	6/5/4	Y	-	T4
[4]	MK22FN256CAH12R	120	Y	-	16ch	64	WLCSP	40	256	256	-	-	48	1	Y	4	1	1	-	2	5/2	2	1	-	1x8ch	2x2ch	2	22	1	2	5/4	Y	Y	T5,F2
[4]	MK22FN256CAP12R	120	Y	-	16ch	80	WLCSP	52	256	256	-	-	128	1	Y	4	1	1	-	2	5/2	2	1	-	2x8ch	2x2ch	4	23	1	2	5/4	Y	Y	T5,F2
[2,4]	MK22FN256VDC12	120	Y	-	16ch	121	XFPGA	70	256	256	-	-	48	1	Y	4	1	1	-	2	6/4	2	1	-	1x8ch	2x2ch	4	36	1	2	6/4	Y	Y	T5,F2
[2,4]	MK22FN256VLH12	120	Y	-	16ch	64	LQFP	40	256	256	-	-	48	1	Y	4	1	1	-	2	5/2	2	1	-	1x8ch	2x2ch	2	22	1	2	5/4	Y	Y	T5,F2
[2,4]	MK22FN256VLL12	120	Y	-	16ch	100	LQFP	66	256	256	-	-	48	1	Y	4	1	1	-	2	6/4	2	1	-	1x8ch	2x2ch	4	33	1	2	5/4	Y	Y	T5,F2
[2,4]	MK22FN256VMP12	120	Y	-	16ch	64	MAPBGA	40	256	256	-	-	48	1	Y	4	1	1	-	2	5/2	2	1	-	1x8ch	2x2ch	2	22	1	2	5/4	Y	Y	T5,F2
[4]	MK22FN512CAP12R	120	Y	-	16ch	80	WLCSP	52	512	512	-	-	128	1	Y	4	1	1	-	2	5/2	2	1	-	2x8ch	2x2ch	4	23	1	2	5/4	Y	Y	T5,F2
[4]	MK22FN512CBP12R	120	Y	-	16ch	80	WLCSP	52	512	512	-	-	128	1	Y	4	1	1	-	2	5/2	2	1	-	2x8ch	2x2ch	4	23	1	2	5/4	Y	Y	T5,F2
[2,4]	MK22FN512VDC12	120	Y	-	16ch	121	XFPGA	81	512	512	-	-	128	1	Y	4	1	1	-	2	6/4	2	1	-	2x8ch	2x2ch	4	38	2	2	6/5	Y	Y	T5,F2
[2,4]	MK22FN512VFX12	120	Y	-	16ch	88	QFN	60	512	512	-	-	128	1	Y	4	1	1	-	2	6/4	2	1	-	2x8ch	2x2ch	4	38	1	2	6/5	Y	Y	T5,F2
[2,4]	MK22FN512VLH12	120	Y	-	16ch	64	LQFP	40	512	512	-	-	128	1	Y	4	1	1	-	2	5/2	2	1	-	2x8ch	2x2ch	2	22	1	2	5/4	Y	Y	T5,F2
[2,4]	MK22FN512VLL12	120	Y	-	16ch	100	LQFP	66	512	512	-	-	128	1	Y	4	1	1	-	2	6/4	2	1	-	2x8ch	2x2ch	4	33	1	2	5/4	Y	Y	T5,F2
[2,4]	MK22FN512VMP12	120	Y	-	16ch	64	MAPBGA	40	512	512	-	-	128	1	Y	4	1	1	-	2	5/2	2	1	-	2x8ch	2x2ch	2	22	1	2	5/4	Y	Y	T5,F2
[1,2,3]	MK22FX512AVLH12	120	Y	Y	16ch	64	LQFP	40	640	512	128	4	128	1	-	3	1	1	-	1	5	3	1	1	2x8ch	2x2ch	2	22	1	3	6/4/2	Y	-	
[1,2,3]	MK22FX512AVLK12	120	Y	Y	16ch	80	LQFP	52	640	512	128	4	128	1	-	4	1	1	8	2	5/3	3	1	1	2x8ch	2x2ch	3	27	1	3	6/4/2	Y	-	
[1,2,3]	MK22FX512AVLL12	120	Y	Y	16ch	100	LQFP	66	640	512	128	4	128	1	-	5	1	1	8	3	6/4/1	3	1	1	2x8ch	2x2ch	5	33	1	3	6/4/2	Y	-	
[1,2,3]	MK22FX512AVLQ12	120	Y	Y	16ch	144	LQFP	100	640	512	128	4	128	1	-	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	5	42	2	3	6/5/4	Y	-	
[1,2,3]	MK22FX512AVMC12	120	Y	Y	16ch	121	MAPBGA	86	640	512	128	4	128	1	-	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	5	38	2	3	6/5/4	Y	-	
[1,2,3]	MK22FX512AVMD12	120	Y	Y	16ch	144	MAPBGA	100	640	512	128	4	128	1	-	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	5	42	2	3	6/5/4	Y	-	

Common Features

Ambient Temp Range (BGA, QFN, LQFP): -40 C to 105 C

Ambient Temp Range (WLCSP): -40 C to 85 C

Flash Write Voltage: 1.71 V

Main OSC (Oscillator crystal/resonator): 32–40 KHz/8–32 MHz

Debug: JTAG, cJTAG, SWD,

RTC (32 KHz OSC, Vbat)

Trace: TPIU, FPB, DWT, ITM, ETM

PIT (32 bit): 1x4ch

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block

Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP

Serial Programming Interface, USB OTG LS/FS (1)

Vref

Footnotes

[1] USB Device Charge Detect, [1] CMT (Carrier Module Transmitter)

[2] USB 120mAReg, [3] 5V Tolerant

[3] Trace: TPIU, FPB, DWT, ITM, ETM, ETB, [4] Low Power UART (1)

[4] Crystal-less USB Enabled (FS Mode ON), [4] 48 MHz IRC

K24 SUB-FAMILY: MCUs WITH USB FULL-SPEED CRYSTAL-LESS AND 256 KB SRAM

Footnotes	Part Number	CPU Frequency	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	5 V I/O Tolerant	Total Flash Memory (KB)	SRAM (KB)	USB Controllers	USB Full-Speed+PHY Crystal-less	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Evaluation Board (See Page 17)
	MK24FN1M0CAJ12R	120 MHz	Y	Y	16ch	142	WLCSP	100	Y	1,024	256	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	5ch	34ch	2	3	6/5/4	Y	Y	Y	T11,F3
	MK24FN1M0VDC12	120 MHz	Y	Y	16ch	121	XFBGA	83	Y	1,024	256	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4ch	37ch	2	3	6/5/4	Y	Y	Y	T11,F3
	MK24FN1M0VLL12	120 MHz	Y	Y	16ch	100	LQFP	66	Y	1,024	256	1	Y	5	1	1	4	3	6/4/1	3	1	1	2x8ch	2x2ch	4ch	32ch	1	3	5/4/2	Y	Y	Y	T11,F3
	MK24FN1M0VLQ12	120 MHz	Y	Y	16ch	144	LQFP	100	Y	1,024	256	1	Y	5	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4ch	41ch	2	3	6/5/4	Y	Y	Y	T11,F3
	MK24FN256VDC12	120 MHz	Y	–	16ch	121	XFBGA	83	Y	256	256	1	Y	6	1	1	–	3	6/4/2	3	1	–	2x8ch	2x2ch	4ch	37ch	1	2	6/5	Y	Y	–	T14

Common Features

Ambient Temp Range (BGA, QFP): -40 C to 105C
 Ambient Temp Range (WLCSP): -40 C to 85C
 Voltage Range: 1.71–3.6V Flash Write Voltage: 1.71V
 Main OSC: 32–40 KHz/8–32 MHz
 Debug: JTAG, cJTAG, SWD
 RTC (32 KHz OSC, Vbat), 48 MHZ IRC
 PIT (32 bit): 1x4ch, Crystal-less USB Enabled (FS Mode ON)

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
 Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP Serial Programming Interface, CMT (Carrier Module Transmitter)
 Hardware Encryption
 USB Device Charge Detect, USB 120 mAREg, USB FS Crystal-less operations (Device mode only)
 Trace: TPIU, FPB, DWT, ITM, ETM, ETB

K26 SUB-FAMILY: MCUs WITH DUAL HIGH-SPEED AND FULL-SPEED USBs WITH PHY AND 2 MB FLASH

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory	SRAM (KB)	USB Controllers	USB Full-Speed + PHY Crystal-less	USB High-Speed + PHY	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Evaluation Board (See Page 17)
[1]	MK26FN2M0CAC18R	180	Y	Y	32ch	169	WLCSP	116	2,048	256	2	1	1	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	3ch	45ch	2	4	6/6/4/4	Y	Y	Y	T15/F5
[1]	MK26FN2M0VLQ18	180	Y	Y	32ch	144	LQFP	100	2,048	256	2	1	1	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	1ch	39ch	2	4	6/6/4/4	Y	Y	Y	T15/F5
[1]	MK26FN2M0VMD18	180	Y	Y	32ch	144	MAPBGA	100	2,048	256	2	1	1	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	1ch	39ch	2	4	6/6/4/4	Y	Y	Y	T15/F5
[1]	MK26FN2M0VMI18	180	Y	Y	32ch	169	MAPBGA	116	2,048	256	2	1	1	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	3ch	45ch	2	4	6/6/4/4	Y	Y	Y	T15/F5

Common Features

Ambient Temp Range (WLCSP): -40° C to 85° C
 Ambient Temp Range (BGA, LQFP): -40° C to 105° C
 Voltage voltage: 1.71 to 3.6 V
 Flash Write Voltage: 1.71 V
 Main OSC: 32–40 kHz/3–32 MHz
 Debug: JTAG, cJTAG, SWD
 RTC (32KHz OSC, Vbat), 48 MHZ IRC
 PIT (32 bit): 1x4ch, Hardware Watchdog, Software Watchdog,
 2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
 PMC, MCG, NMI, CRC, DSP
 Serial Programming Interface, CMT (Carrier Module Transmitter)
 USB Device Charge Detect, Crystal-less FS USB (device mode only), USB LS/
 FS and USB HS with integrated HS PHY

Footnote

[1]: 8KB I/D cache

K27 SUB-FAMILY: MCUs WITH DUAL HIGH-SPEED AND FULL-SPEED USBs AND LARGE MEMORY

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Core Voltage Bypass	Total Flash Memory	SRAM (KB)	Cache (KB)	USB Controllers	USB Full-Speed + PHY Crystal-less	USB High-Speed + PHY	Low-Power UART (Total)	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	QuadSPI	32-bit SDRAM Controller	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Evaluation Board (See Page 17)
	MK27FN2M0AVMI15	150	Y	Y	32ch	169	MAPBGA	120	—	2,048	1,024	16	2	1	1	5	8	4	6/4/2/1	4	2	—	Y	Y	2x8ch	2x2ch	3ch	18ch	1	2	5/4	Y	Y	Y	F1

Common Features

Ambiant Temp Range (BGA): -40° C to 105° C

Voltage voltage:1.71 to 3.6 V

Flash Write Voltage: 1.71 V

Main OSC:32-40 kHz/3–32 MHz

Debug: JTAG,cJTAG,SWD

RTC(32KHz OSC,Vbat), 48 MHz IRC

PIT (32 bit): 1x4ch, Hardware Watchdog, Software Watchdog,

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block

PMC, MCG, NMI, CRC, DSP

Serial Programming Interface

USB Device Charge Detect, Crystal-less FS USB (device mode only), USB LS/FS and USB HS with integrated HS PHY

Octal, DTR QuadSPI supports eXecution-In-Place (XIP)

K28 SUB-FAMILY: MCUs WITH DUAL HIGH-SPEED AND FULL-SPEED USBs, LARGE MEMORY AND CORE VOLTAGE BYPASS

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Core Voltage Bypass	Total Flash Memory	SRAM (KB)	Cache (KB)	USB Controllers	USB Full-Speed + PHY Crystal-less	USB High-Speed + PHY	Low-Power UART (Total)	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	QuadSPI	32-bit SDRAM Controller	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Evaluation Board (See Page 17)
[1]	MK28FN2M0AVMI15	150	Y	Y	32ch	169	MAPBGA	120	Y	2,048	1,024	16	2	1	1	5	8	4	6/4/2/1	4	2	—	Y	Y	2x8ch	2x2ch	3ch	18ch	1	2	5/4	Y	Y	Y	F1
[1]	MK28FN2M0ACAU15R	150	Y	Y	32ch	210	WLCSP	120	Y	2,048	1,024	16	2	1	1	5	8	4	6/4/2/1	4	2	—	Y	Y	2x8ch	2x2ch	3ch	18ch	1	2	5/4	Y	Y	Y	F1

Common Features

Ambiant Temp Range (BGA): -40° C to 105° C

Ambiant Temp Range (WLCSP): -40° C to 85° C

Voltage voltage:1.71 to 3.6 V

Flash Write Voltage: 1.71 V

Main OSC:32-40 kHz/3–32 MHz

Debug: JTAG,cJTAG,SWD

RTC(32KHz OSC,Vbat), 48 MHz IRC

PIT (32 bit): 1x4ch, Hardware Watchdog, Software Watchdog,

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block

PMC, MCG, NMI, CRC, DSP

Serial Programming Interface

USB Device Charge Detect, Crystal-less FS USB (device mode only), USB LS/

FS and USB HS with integrated HS PHY

Octal, DTR QuadSPI supports eXecution-In-Place (XIP)

Footnote:

[1]: Power Management Controller with Core Voltage Bypass

Kinetis K3x Family of Segment LCD MCUs

OVERVIEW

The Kinetis K3x MCU family, based on the Arm® Cortex®-M4 core, is pin, peripheral and software compatible with the K10 MCU family and adds a flexible low-power segment LCD controller with support for up to 320 segments. Devices start from 64 KB of flash in a 64-pin LQFN package extending up to 512 KB in a 144-pin MAPBGA package with a rich suite of analog, communication, timing and control peripherals. For more information about the Kinetis K3x MCU family, [click here](#).

TARGET APPLICATIONS:

Thermostats, smart meters, heart rate monitors, blood gas analyzers

K30 SUB-FAMILY: SEGMENT LCD MCUs

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Segment LCD	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	MPU	DMA	GPIO (w interrupt)	Evaluation Board (See Page 24)
	MK30DX128VLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	3/4/2/0	–	16ch	40	T7
	MK30DX128VLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	–	16ch	56	T7
	MK30DX128VLL7	72 MHz	100	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/2/0	–	16ch	68	T7
	MK30DX128VMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/3/0	–	16ch	72	T7
	MK30DX256VLH7	72 MHz	64	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	3/4/2/0	–	16ch	40	T7
	MK30DX256VLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	–	16ch	56	T7
	MK30DX256VLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/2/0	–	16ch	68	T7
	MK30DX256VMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/3/0	–	16ch	72	T7
	MK30DX64VLH7	72 MHz	64	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	3/4/2/0	–	16ch	40	T7
	MK30DX64VLK7	72 MHz	80	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	–	16ch	56	T7
	MK30DX64VMC7	72 MHz	121	MAPBGA	96 KB	64 KB	32 KB	2 KB	16 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/3/0	–	16ch	72	T7
[1]	MK30DN512VLK10	100 MHz	80	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	4	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	Y	16ch	56	T7
[1]	MK30DN512VLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	5	1	1	4	32x8/36x4	6/4/1	2	1	2	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/2/0	Y	16ch	68	T7
[1]	MK30DN512VLL10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DN512VMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	38x8/42x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/4/3/0	Y	16ch	90	T7
[1]	MK30DN512VMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DX128VLQ10	100 MHz	144	LQFP	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DX128VMD10	100 MHz	144	MAPBGA	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DX256VLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DX256VMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7

Common Features

Temp Range: -40° C to 105° C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Main OSC: 32–40 KHz 3–32 MHz
Debug: JTAG, cJTAG, SWD

RTC (32 KHz OSC, Vbat)
PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
5 V Tolerant, V ref, Trace: TPIU, FPB, DWT, ITM

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Kinetis K4x Family of USB and Segment LCD MCUs

OVERVIEW

The Kinetis K4x MCU family, based on the Arm® Cortex®-M4 core, adds full-speed USB 2.0 On-The-Go with device charger detect capability and a flexible, low-power segment LCD controller with support for up to 320 segments. Devices start from 64 KB of flash in a 64-pin LQFN package extending up to 512 KB in a 144-pin MAPBGA package with a rich suite of analog, communication, timing and control peripherals. For more information about the Kinetis K4x MCU family, [click here](#).

TARGET APPLICATIONS:

GPS receivers, blood glucose meters, bike computers, currency counters

K40 SUB-FAMILY: SEGMENT LCD MCUs WITH USB

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Segment LCD	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	MPU	DMA	GPIO (w interrupt)	Evaluation Board (See Page 24)
	MK40DX128VLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	18ch	2	1	3	3/4/2/0	–	16ch	36	T7
	MK40DX128VLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	–	16ch	52	T7
	MK40DX128VLL7	72 MHz	100	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/2/0	–	16ch	64	T7
	MK40DX128VMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/3/0	–	16ch	68	T7
	MK40DX256VLH7	72 MHz	64	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	18ch	2	1	3	3/4/2/0	–	16ch	36	T7
	MK40DX256VLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	–	16ch	52	T7
	MK40DX256VLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/2/0	–	16ch	64	T7
	MK40DX256VMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/3/0	–	16ch	68	T7
	MK40DX64VLH7	72 MHz	64	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	1x2ch	2	1	1	2ch	18ch	2	1	3	3/4/2/0	–	16ch	36	T7
	MK40DX64VLK7	72 MHz	80	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	–	16ch	52	T7
	MK40DX64VLL7	72 MHz	100	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	1x2ch	2	1	1	2ch	18ch	2	1	3	3/4/2/0	–	16ch	36	T7
	MK40DX64VMC7	72 MHz	121	MAPBGA	96 KB	64 KB	32 KB	2 KB	16 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/3/0	–	16ch	68	T7
[1]	MK40DN512VLK10	100 MHz	80	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	4	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	Y	16ch	52	T7
[1]	MK40DN512VLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	5	1	1	4	32x8/36x4	6/4/1	2	1	2	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/2/0	Y	16ch	64	T7
[1]	MK40DN512VLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DN512VMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	38x8/42x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/4/3/0	Y	16ch	86	T7
[1]	MK40DN512VMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DX128VLQ10	100 MHz	144	LQFP	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DX128VMD10	100 MHz	144	MAPBGA	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DX256VLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DX256VMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7

Common Features

Temp Range: -40° C to 105° C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD

RTC (32 KHz OSC, Vbat)
Trace: TPIU, FPB, DWT, ITM
PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Kinetis K5x Family of Measurement MCUs

OVERVIEW

The Kinetis K5x MCU family, based on the Arm® Cortex®-M4 core, provides designers with an analog measurement engine consisting of integrated operational and trans-impedance amplifiers as well as high-resolution ADC and DAC modules. The family also features IEEE® 1588 Ethernet and hardware encryption, full-speed USB 2.0 On-The-Go with device charger detect capability and a flexible low-power segment LCD controller with support for up to 320 segments. Devices start from 128 KB of flash in a 64-pin QFN package extending up to 512 KB in a 144-pin MAPBGA package. For more information about the Kinetis K5x MCU family, [click here](#).

TARGET APPLICATIONS:

Low-power portable medical devices, clinical and lab equipment, test/measurement equipment, instrumentation applications, monitor and tele-health applications

K50 SUB-FAMILY: MEASUREMENT MCUs WITH USB

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Segment LCD	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	OPAMP	TRIAMP	MPU	DMA	GPIO (w interrupt)	Evaluation Board (See Page 24)
	MK50DX128CLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	–	5/0/0	2	1	–	1x8ch	2x2ch	2	1	1	2ch	22ch	1	1	2	6/4/1/0	2	1	–	16ch	35	T8
	MK50DX128CLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	–	5/1/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	30ch	2	1	3	6/5/3/0	2	1	–	16ch	39	T8
	MK50DX128CMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	–	6/4/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	36ch	2	1	3	6/5/5/0	2	1	–	16ch	63	T8
	MK50DX256CLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	–	5/1/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	30ch	2	1	3	6/5/3/0	2	1	–	16ch	39	T8
	MK50DX256CLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	–	6/3/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/5/5/0	2	1	–	16ch	59	T8
	MK50DX256CMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	–	6/4/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	36ch	2	1	3	6/5/5/0	2	1	–	16ch	63	T8
[1]	MK50DN512CLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	5	1	1	4	–	6/3/1	2	1	–	1x8ch	2x2ch	2	1	1	4ch	34ch	2	2	3	6/5/5/0	2	2	Y	16ch	59	T8
[1]	MK50DN512CLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8
[1]	MK50DN512CMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	37ch	2	2	3	6/5/5/0	2	2	Y	16ch	78	T8
[1]	MK50DN512CMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8
[1]	MK50DX256CLK10	100 MHz	80	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	4	1	1	–	–	5/1/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	30ch	2	2	3	6/5/3/0	2	2	Y	16ch	39	T8
[1]	MK50DX256CLL10	100 MHz	100	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	5	1	1	4	–	6/3/1	2	1	–	1x8ch	2x2ch	2	1	1	4ch	34ch	2	2	3	6/5/5/0	2	2	Y	16ch	59	T8
[1]	MK50DX256CMC10	100 MHz	121	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	37ch	2	2	3	6/5/5/0	2	2	Y	16ch	78	T8
[1]	MK50DX256CMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8

Common Features

Temp Range: -40° C to 85° C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, 5 V Tolerant

Trace: TPIU, FPB, DWT, ITM
PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg

KINETIS K5XMEASUREMENT MCUs

Product	CPU	Memory	HMI	Communications		Analog					Security	
	Arm Cortex-M4		Segment LCD (frontplanes x backplanes)	USB 2.0	10/100Mbps Ethernet w/ IEEE 1588	16-bit SAR DAC	12-bit DAC	PGA	OPAMP	TRIAMP	RNG	mmCAU
K53 Segment LCD & Ethernet	100 MHz	512 KB Flash 64–128 KB SRAM External Bus Interface	Up to 40x8/44x4	1x Full-Speed	1 MII/RMII	2	2	2	2	2	Y	Y
K52 Ethernet	100 MHz	512 KB Flash 128 KB SRAM External Bus Interface		1x Full-Speed	1 MII/RMII	2	2	2	2	2	Y	Y
K51 Segment LCD	100 MHz	256–512 KB Flash 64–128 KB SRAM External Bus Interface*	Up to 40x8/44x4	1x Full-Speed		2	2	2	2	2		
	72 MHz	160–288 KB Flash 32–64 KB SRAM	Up to 36x8/40x4	1x Full-Speed		2	1	2*	2	1		
K50 Mainstream	100 MHz	256–512 KB Flash 64–128 KB SRAM External Bus Interface		1x Full-Speed		2	2	2	2	2		
	72 MHz	160–288 KB Flash 32–64 KB SRAM		1x Full-Speed		2	1	2*	2	1		

*Feature only supported by a subset family

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

K51 SUB-FAMILY: MEASUREMENT MCUs WITH SEGMENT LCD AND USB

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Segment LCD	SPI + Chip Selects	I ² C	I ² S	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	OPAMP	TRIAMP	MPU	DMA	GPIO (w interrupt)	Evaluation Board (See Page 24)
	MK51DX128CLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	16x8/20x4	5/0/0	1	1	1x8ch	2x2ch	2	1	1	2ch	18ch	1	1	2	3/4/1/0	2	1	–	16ch	31	T8
	MK51DX128CLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	24x8/28x4	5/2/0	2	1	1x8ch	2x2ch	2	1	1	4ch	30ch	2	1	3	6/5/3/0	2	1	–	16ch	39	T8
	MK51DX128CMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/5/5/0	2	1	–	16ch	61	T8
	MK51DX256CLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	24x8/28x4	5/2/0	2	1	1x8ch	2x2ch	2	1	1	4ch	30ch	2	1	3	6/5/3/0	2	1	–	16ch	39	T8
	MK51DX256CLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	32x8/36x4	6/3/0	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/5/5/0	2	1	–	16ch	57	T8
	MK51DX256CMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/5/5/0	2	1	–	16ch	61	T8
[1]	MK51DN256CLQ10	100 MHz	144	LQFP	256 KB	256 KB	–	–	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	94	T8
[1]	MK51DN256CMD10	100 MHz	144	MAPBGA	256 KB	256 KB	–	–	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	94	T8
[1]	MK51DN512CLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	4	32x8/36x4	6/3/1	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	2	3	6/5/5/0	2	2	Y	16ch	57	T8
[1]	MK51DN512CLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	94	T8
[1]	MK51DN512CMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	38x8/42x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	37ch	2	2	3	6/5/5/0	2	2	Y	16ch	78	T8
[1]	MK51DN512CMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	94	T8
[1]	MK51DX256CLK10	100 MHz	80	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	4	1	1	–	24x8/28x4	5/2/0	2	1	1x8ch	2x2ch	2	1	1	4ch	30ch	2	2	3	6/5/3/0	2	2	Y	16ch	39	T8
[1]	MK51DX256CLL10	100 MHz	100	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	4	1	1	4	32x8/36x4	6/3/1	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	2	3	6/5/5/0	2	2	Y	16ch	57	T8
[1]	MK51DX256CMC10	100 MHz	121	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	38x8/42x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	37ch	2	2	3	6/5/5/0	2	2	Y	16ch	78	T8

Common Features

Temp Range: -40° C to 85° C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, 5 V Tolerant

Trace: TPIU, FPB, DWT, ITM
PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

K52 SUB-FAMILY: MEASUREMENT MCUs WITH USB AND ETHERNET

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I ² C	I ² S	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	OPAMP	TRIAMP	MPU	DMA	GPIO (w interrupt)	Evaluation Board (See Page 24)
	MK52DN512CLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8
	MK52DN512CMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8

Common Features

Temp Range: -40° C to 85° C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, 5 V Tolerant

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)

Hardware Encryption
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

K53 SUB-FAMILY: MEASUREMENT MCUs WITH USB, SEGMENT LCD AND ETHERNET

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Ethernet w/1588	SPI + Chip Selects	I ² C	I ² S	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	OPAMP	TRIAMP	DMA	GPIO (w interrupt)	Evaluation Board (See Page 24)
	MK53DN512CLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	16ch	94	T8
	MK53DN512CMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	16ch	94	T8
	MK53DX256CLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	16ch	94	T8
	MK53DX256CMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	16ch	94	T8

Common Features

Temp Range: -40° C to 85° C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, 5 V Tolerant

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)

Ethernet w/1588:
Hardware Encryption, MPU
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Kinetis K6x Family of Ethernet MCUs

OVERVIEW

The Kinetis K6x MCU family, based on the Arm® Cortex®-M4 core, are pin, peripheral and software compatible with many of the Kinetis K series MCU families, offering IEEE 1588 Ethernet and full- and optional high-speed USB 2.0 On-The-Go, including options with USB crystal-less functionality. Devices start from 256 KB of flash in a 100-pin QFP package extending up to 1 MB of flash and 256 KB of SRAM in a 256-pin MAPBGA package. These devices offer various levels of integration, with a rich suite of analog, communication, timing and control peripherals. For more information about the Kinetis K6x MCU family, [click here](#).

TARGET APPLICATIONS:

Building control, factory automation, industrial drivers, IoT data concentrators, medical monitoring

KINETIS® K6X ETHERNET MCUs

Product	CPU	Memory	Communications		Analog			Security		
	Arm Cortex-M4		10/100Mbps Ethernet w/ IEEE 1588	USB 2.0 Controllers	PGA	16-bit SAR DAC	12-bit DAC	RNG	mmCAU	Anti-tamper
K66 Performance	180 MHz w/ FPU	1–2 MB Flash 256 KB SRAM SDRAM Controller	1 MII/RMII	2x Full-Speed Crystal-less + High-Speed w/ HS PHY		2	2	Y	Y	
K65 Performance & Anti-tamper	180 MHz w/ FPU	1–2 MB Flash 256 KB SRAM SDRAM Controller	1 MII/RMII	2x Full-Speed Crystal-less + High-Speed w/ HS PHY		2	2	Y	Y	Y
K64 High SRAM	120 MHz w/ FPU	640 KB–1 MB Flash 256 KB SRAM	1 MII*/RMII	1x Full-Speed Crystal-less		2	2*	Y	Y	
K63 High SRAM & Anti-tamper	120 MHz w/ FPU	1 MB Flash 256 KB SRAM	1 MII/RMII	1x Full-Speed Crystal-less		2	2	Y	Y	Y
K61 Mixed Signal & Anti-tamper	120–150 MHz w/ FPU	1 MB Flash 128 KB SRAM NAND Controller DDR1/DDR2/LPDDR1 Controller*	1 MII/RMII	2x Full-Speed + High-Speed (no HS PHY)	4	4	2	Y	Y	Y
K60 Mixed Signal	120 MHz w/ FPU	1 MB Flash 128 KB SRAM NAND Controller	1 MII/RMII	2x Full-Speed + High-Speed (no HS PHY)	4	4	2	Y	Y	
	100 MHz	256–512 KB Flash 64–128 KB SRAM	1 MII*/RMII	1x Full-Speed	2	2	2*	Y	Y	

*Feature only supported by a subset family

K60 SUB-FAMILY: ETHERNET MCUs WITH MIXED-SIGNAL INTEGRATION

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	Cache (KB)	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	USB Controllers	USB Full-Speed + PHY	USB High-Speed	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	PGA	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)
	MK60DN256VLL10	100	-	Y	16ch	100	LQFP	66	256	256	-	-	64	-	RMII	1x3ch	1	Y	-	5	1	1	4	3	6/4/1	2	1	2	1x8ch	2x2ch	4	33	1	2	3	6/5/5	Y	Y	Y	-	-	T9
	MK60DN256VLQ10	100	-	Y	16ch	144	LQFP	100	256	256	-	-	64	-	MII / RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	42	2	2	3	6/5/4	Y	Y	Y	-	-	T9
	MK60DN256VMC10	100	-	Y	16ch	121	MAPBGA	86	256	256	-	-	64	-	RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	38	2	2	3	6/4/3	Y	Y	Y	-	-	T9
	MK60DN256VMD10	100	-	Y	16ch	144	MAPBGA	100	256	256	-	-	64	-	MII / RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	42	2	2	3	6/5/4	Y	Y	Y	-	-	T9
	MK60DN512VLL10	100	-	Y	16ch	100	LQFP	66	512	512	-	-	128	-	RMII	1x3ch	1	Y	-	5	1	1	4	3	6/4/1	2	1	2	1x8ch	2x2ch	4	33	1	2	3	6/5/5	Y	Y	Y	-	-	T9
	MK60DN512VLQ10	100	-	Y	16ch	144	LQFP	100	512	512	-	-	128	-	MII / RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	42	2	2	3	6/5/4	Y	Y	Y	-	-	T9
	MK60DN512VMC10	100	-	Y	16ch	121	MAPBGA	86	512	512	-	-	128	-	RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	38	2	2	3	6/4/3	Y	Y	Y	-	-	T9
	MK60DN512VMD10	100	-	Y	16ch	144	MAPBGA	100	512	512	-	-	128	-	MII / RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	42	2	2	3	6/5/4	Y	Y	Y	-	-	T9
[1]	MK60DN512ZCAB10R	100	-	Y	16ch	120	WLCSP	79	512	512	-	-	128	-	RMII	1x4ch	1	Y	-	6	1	1	4	3	6/4/1	2	1	2	1x8ch	2x2ch	4	38	2	2	3	6/5/3	Y	Y	Y	-	-	T9
	MK60DX256VLL10	100	-	Y	16ch	100	LQFP	66	512	256	256	4	64	-	RMII	1x3ch	1	Y	-	5	1	1	4	3	6/4/1	2	1	2	1x8ch	2x2ch	4	33	1	2	3	6/5/5	Y	Y	Y	-	-	T9
	MK60DX256VLQ10	100	-	Y	16ch	144	LQFP	100	512	256	256	4	64	-	MII / RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	42	2	2	3	6/5/4	Y	Y	Y	-	-	T9
	MK60DX256VMC10	100	-	Y	16ch	121	MAPBGA	86	512	256	256	4	64	-	RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	38	2	2	3	6/4/3	Y	Y	Y	-	-	T9
	MK60DX256VMD10	100	-	Y	16ch	144	MAPBGA	100	512	256	256	4	64	-	MII / RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	2	1	2	1x8ch	2x2ch	4	42	2	2	3	6/5/4	Y	Y	Y	-	-	T9
[2][3]	MK60FN1M0VLQ12	120	Y	Y	32ch	144	LQFP	100	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	58	2	4	4	5/2/2/5	Y	Y	Y	-	-	T10
[2][3]	MK60FN1M0VLQ15	150	Y	Y	32ch	144	LQFP	100	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	58	2	4	4	5/2/2/5	Y	Y	Y	-	-	T10
[2][3]	MK60FN1M0VMD12	120	Y	Y	32ch	144	MAPBGA	100	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	58	2	4	4	5/2/2/5	Y	Y	Y	-	-	T10
[2][3]	MK60FN1M0VMD15	150	Y	Y	32ch	144	MAPBGA	100	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	58	2	4	4	5/2/2/5	Y	Y	Y	-	-	T10
[2][3]	MK60FX512VLQ12	120	Y	Y	32ch	144	LQFP	100	1024	512	512	16	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	58	2	4	4	5/2/2/5	Y	Y	Y	-	-	T10
[2][3]	MK60FX512VLQ15	150	Y	Y	32ch	144	LQFP	100	1024	512	512	16	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	58	2	4	4	5/2/2/5	Y	Y	Y	-	-	T10
[2][3]	MK60FX512VMD12	120	Y	Y	32ch	144	MAPBGA	100	1024	512	512	16	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	58	2	4	4	5/2/2/5	Y	Y	Y	-	-	T10
[2][3]	MK60FX512VMD15	150	Y	Y	32ch	144	MAPBGA	100	1024	512	512	16	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	58	2	4	4	5/2/2/5	Y	Y	Y	-	-	T10

Common Features

Ambient Temp Range: -40C to 105C
Voltage Range: 1.71–3.6 V
Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD, 48 MHz IRC
PIT (32 bit): 1x4ch
2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
USB Device Charge Detect, USB 120 mAReg
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Footnotes

[1] Ambient Temp Range: -40C to 85C
[2] Main OSC: 32–40 KHz/8–32 MHz, Secondary OSC: 32–40 KHz/8–32 MHz
[3] NAND Flash Controller

K61 SUB-FAMILY : ETHERNET MCUs WITH ANTI-TAMPER/ADVANCED SECURITY

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	Cache (KB)	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	USB Controllers	USB Full-Speed + PHY	USB High-Speed	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	PGA	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)
[1][2]	MK61FN1M0CAA12R	120	Y	Y	32ch	143	WLCS	79	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	4	3	6/4/1	2	2	2	2x8ch	2x2ch	4	45	2	4	4	5/1/2/5	Y	Y	Y	Y	4	T10
[2]	MK61FN1M0VMD12	120	Y	Y	32ch	144	MAPBGA	95	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	53	2	4	4	5/2/2/5	Y	Y	Y	Y	6	T10
[2]	MK61FN1M0VMD15	150	Y	Y	32ch	144	MAPBGA	95	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	53	2	4	4	5/2/2/5	Y	Y	Y	Y	6	T10
[2][3]	MK61FN1M0VMJ12	120	Y	Y	32ch	256	MAPBGA	128	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	77	2	4	4	5/2/2/5	Y	Y	Y	Y	8	T10
[2][3]	MK61FN1M0VMJ15	150	Y	Y	32ch	256	MAPBGA	128	1024	1024	-	-	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	77	2	4	4	5/2/2/5	Y	Y	Y	Y	8	T10
[2]	MK61FX512VMD12	120	Y	Y	32ch	144	MAPBGA	95	1024	512	512	16	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	53	2	4	4	5/2/2/5	Y	Y	Y	Y	6	T10
[2]	MK61FX512VMD15	150	Y	Y	32ch	144	MAPBGA	95	1024	512	512	16	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	53	2	4	4	5/2/2/5	Y	Y	Y	Y	6	T10
[2][3]	MK61FX512VMJ12	120	Y	Y	32ch	256	MAPBGA	128	1024	512	512	16	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	77	2	4	4	5/2/2/5	Y	Y	Y	Y	8	T10
[2][3]	MK61FX512VMJ15	150	Y	Y	32ch	256	MAPBGA	128	1024	512	512	16	128	16	MII / RMII	1x4ch	2	Y	Y (no PHY)	6	2	-	8	3	6/4/2	2	2	2	2x8ch	2x2ch	4	77	2	4	4	5/2/2/5	Y	Y	Y	Y	8	T10

Common Features

Ambient Temp Range: -40C to 105C

Voltage Range: 1 .71-3 .6 V

[2] Main OSC: 32-40 KHz/8-32 MHz, Secondary OSC: 32-40 KHz/8-32 MHz

Debug: JTAG, cJTAG, SWD, 48 MHz IRC

PIT (32 bit): 1x4ch

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block

Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP

USB Device Charge Detect, USB 120 mAReg

Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Footnotes

[1] Ambient Temp Range: -40C to 85C

[2] NAND Flash Controller

[4] Dynamic RAM Controller: DDR1, DDR2, LPDDR1

K63 SUB-FAMILY: ETHERNET MCUs WITH 256KB SRAM AND TAMPER DETECTION

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	Cache (KB)	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	USB Controllers	USB Full-Speed + PHY	USB High-Speed	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	PGA	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)
	MK63FN1M0VLQ12	120	Y	Y	16ch	144	LQFP	100	1024	1024	-	-	256	-	MII / RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4	41	2	-	3	4/3/3	Y	Y	Y	Y	3	T11
	MK63FN1M0VMD12	120	Y	Y	16ch	144	MAPBGA	95	1024	1024	-	-	256	-	MII / RMII	1x4ch	1	Y	-	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4	41	2	-	3	6/5/4	Y	Y	Y	Y	6	T11

Common Features

Ambient Temp Range: -40C to 105C

Voltage Range: 1 .71-3 .6 V

Main OSC: 32-40 KHz/8-32 MHz

Debug: JTAG, cJTAG, SWD, 48 MHz IRC

PIT (32 bit): 1x4ch

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block

Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP

USB Device Charge Detect, USB 120 mAReg

Trace: TPIU, FPB, DWT, ITM, ETM, ETB

USB FS Crystal-less operation (Device only)

K64 SUB-FAMILY: ETHERNET MCUs WITH 256KB SRAM

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	USB Controllers	USB Full-Speed + PHY	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Mot or Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Evaluation Board (See Page 17)
[1]	MK64FN1M0CAJ12R	120	Y	Y	16ch	142	WLCSP	100	1024	1024	-	-	256	MII / RMII	1x4ch	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	5	34	2	3	6/5/4	Y	Y	Y	T11/F3
	MK64FN1M0VDC12	120	Y	Y	16ch	121	XFPGA	83	1024	1024	-	-	256	RMII	1x3ch	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4	37	2	3	6/5/4	Y	Y	Y	T11/F3
	MK64FN1M0VLL12	120	Y	Y	16ch	100	LQFP	66	1024	1024	-	-	256	RMII	1x2ch	1	Y	5	1	1	4	3	6/4/1	3	1	1	2x8ch	2x2ch	4	32	1	3	5/4/2	Y	Y	Y	T11/F3
	MK64FN1M0VLQ12	120	Y	Y	16ch	144	LQFP	100	1024	1024	-	-	256	MII / RMII	1x4ch	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4	41	2	3	6/5/4	Y	Y	Y	T11/F3
	MK64FN1M0VMD12	120	Y	Y	16ch	144	MAPBGA	100	1024	1024	-	-	256	MII / RMII	1x4ch	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4	41	2	3	6/5/4	Y	Y	Y	T11/F3
	MK64FX512VDC12	120	Y	Y	16ch	121	XFPGA	86	640	512	128	4	256	RMII	1x3ch	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4	37	2	3	6/5/4	Y	Y	Y	T11/F3
	MK64FX512VLL12	120	Y	Y	16ch	100	LQFP	66	640	512	128	4	256	RMII	1x2ch	1	Y	5	1	1	4	3	6/4/1	3	1	1	2x8ch	2x2ch	4	32	1	3	5/4/2	Y	Y	Y	T11/F3
	MK64FX512VLQ12	120	Y	Y	16ch	144	LQFP	100	640	512	128	4	256	MII / RMII	1x4ch	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4	41	2	3	6/5/4	Y	Y	Y	T11/F3
	MK64FX512VMD12	120	Y	Y	16ch	144	MAPBGA	100	640	512	128	4	256	MII / RMII	1x4ch	1	Y	6	1	1	8	3	6/4/2	3	1	1	2x8ch	2x2ch	4	41	2	3	6/5/4	Y	Y	Y	T11/F3
	MK64FX512VLQ12	120	144	LQFP	640 KB	512 KB	128 KB	4 KB	256 KB	6	1	1	8	6/4/2	3	1	1	MII/RMII 1x4ch	1x4ch	2x8ch	2x2ch	2	1	1	4ch	41ch	-	2	3	6/5/4/0	16ch	100	T11/F3				
	MK64FX512VMD12	120	144	MAPBGA	640 KB	512 KB	128 KB	4 KB	256 KB	6	1	1	8	6/4/2	3	1	1	MII/RMII 1x4ch	1x4ch	2x8ch	2x2ch	2	1	1	4ch	41ch	-	2	3	6/5/4/0	16ch	100	T11/F3				

Common Features

Ambient Temp Range: -40C to 105C
Voltage Range: 1 .71–3 .6 V
Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD, 48 MHz IRC
PIT (32 bit): 1x4ch

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
USB Device Charge Detect, USB 120 mAReg, USB FS Crystal-less operations (Device only)
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Footnote

[1] Ambient Temp Range: -40C to 85C

K65 SUB-FAMILY: ETHERNET MCUs WITH 2MB FLASH, 256KB SRAM AND TAMPER DETECTION

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	Cache (KB)	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	USB Controllers	USB Full-Speed + PHY	USB High-Speed	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)
[1]	MK65FN2M0CAC18R	180	Y	Y	32ch	169	WLCSP	116	2048	2048	-	-	256	8	MII/RMII	1x4ch	2	Y	Y (w/ PHY)	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	3	45	2	4	6/6/4/4	Y	Y	Y	Y	8	T15
	MK65FN2M0VMI18	180	Y	Y	32ch	169	MAPBGA	116	2048	2048	-	-	256	8	MII/RMII	1x4ch	2	Y	Y (w/ PHY)	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	3	45	2	4	6/6/4/4	Y	Y	Y	Y	8	T15
	MK65FX1M0CAC18R	180	Y	Y	32ch	169	WLCSP	116	1280	1024	256	4	256	8	MII/RMII	1x4ch	2	Y	Y (w/ PHY)	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	3	45	2	4	6/6/4/4	Y	Y	Y	Y	8	T15
	MK65FX1M0VMI18	180	Y	Y	32ch	169	MAPBGA	116	1280	1024	256	4	256	8	MII/RMII	1x4ch	2	Y	Y (w/ PHY)	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	3	45	2	4	6/6/4/4	Y	Y	Y	Y	8	T15

Common Features

Ambient Temp Range: -40C to 105C
Voltage Range: 1.71–3.6 V
Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD, 48 MHz IRC
PIT (32 bit): 1x4ch
2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block

Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
USB Device Charge Detect, USB 120 mAReg, USB Full-Speed Crystal-less operations (Device only)
Trace: TPIU, FPB, DWT, ITM, ETM, ETB
SDRAM Controller

Footnote

[1] Ambient Temp Range: -40C to 85C

K66 SUB-FAMILY: ETHERNET MCU WITH 2 MB FLASH AND 256 KB SRAM

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	Flash (KB)	FlexNVM (KB)	EEPROM/FlexRAM (KB)	SRAM (KB)	Cache (KB)	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	USB Controllers	USB Full-Speed + PHY	USB High-Speed	UART (Total)	High Baudrate UART w/ ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	CAN	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)
	MK66FN2M0VLQ18	180	Y	Y	32ch	144	LQFP	100	2048	2048	-	-	256	8	MII/RMII	1x4ch	2	Y	Y (w/ PHY)	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	1	39	2	4	6/6/4/4	Y	Y	Y	-	-	T15/F4
	MK66FN2M0VMD18	180	Y	Y	32ch	144	MAPBGA	100	2048	2048	-	-	256	8	MII/RMII	1x4ch	2	Y	Y (w/ PHY)	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	1	39	2	4	6/6/4/4	Y	Y	Y	-	-	T15/F4
	MK66FX1M0VLQ18	180	Y	Y	32ch	144	LQFP	100	1280	1024	256	4	256	8	MII/RMII	1x4ch	2	Y	Y (w/ PHY)	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	1	39	2	4	6/6/4/4	Y	Y	Y	-	-	T15/F4
	MK66FX1M0VMD18	180	Y	Y	32ch	144	MAPBGA	100	1280	1024	256	4	256	8	MII/RMII	1x4ch	2	Y	Y (w/ PHY)	6	1	1	8	3	6/4/2	4	1	2	2x8ch	2x2ch	1	39	2	4	6/6/4/4	Y	Y	Y	-	-	T15/F4

Common Features

Ambient Temp Range: -40C to 105C
Voltage Range: 1.71–3.6 V
Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD, 48 MHz IRC
PIT (32 bit): 1x4ch

2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
USB Device Charge Detect, USB 120 mAReg, USB Full-Speed Crystal-less operations (Device only)
Trace: TPIU, FPB, DWT, ITM, ETM, ETB
SDRAM Controller

Kinetis K7x Family of Graphic LCD MCUs

OVERVIEW

The Kinetis K7x MCU family, based on the Arm® Cortex®-M4 core, includes an integrated graphics LCD controller, IEEE 1588 Ethernet MAC, full- and high-speed USB 2.0 On-The-Go with device charger detect capability, hardware encryption and tamper detection capabilities. The K70 MCU is available with 512 KB or 1 MB of flash in a 256-pin MBGA package. Each MCU includes a rich suite of analog, communication, timing and control peripherals. All K70 MCUs include a single precision floating point unit and NAND flash controller. 256-pin versions include an on-chip DRAM controller for system expansion. For more information about the Kinetis K7x MCU family, [click here](#).

TARGET APPLICATIONS:

Industrial control panels, navigational displays, electronic point-of-sales (EPoS) terminals, medical monitoring equipment

K70 SUB-FAMILY: GRAPHICS MCUs WITH HS USB, ETHERNET, DDR CONTROLLER AND TAMPER DETECTION

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	Enhanced SDHC (bit)	Graphic LCD	SPI + Chip Selects	I ² C	I ² S	CAN	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Cache	DMA	GPIO (w interrupt)	Evaluation Board (See Page 24)
	MK70FN1M0VMJ12	120 MHz	256	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	8	800x600	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T13
	MK70FX512VMJ12	120 MHz	256	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	8	800x600	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T13
	MK70FN1M0VMJ15	150 MHz	256	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	8	800x600	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T13
	MK70FX512VMJ15	150 MHz	256	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	8	800x600	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T13

Common Features

Temp Range: -40° C to 105° C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), 5 V Tolerant
Secondary OSC: 32–40 KHz/8–32 MHz

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
SPFPU, V ref, MPU

Hardware Encryption, Tamper Detect
DDR Controller, NAND Flash Controller
USB Device Charge Detect, USB 120 mAReg
USB OTG LS/FS (1), USB OTG LS/FS/HS (1)

Kinetis K8x Family of Scalable and Secure MCUs

OVERVIEW

The Kinetis K8x MCU family extends the Kinetis MCU portfolio with advanced security capabilities while maintaining a high level of compatibility with previous Kinetis MCU devices. Additional security capabilities found within the Kinetis K8x MCU family include:

- ▶ Boot ROM to support encrypted firmware updates
- ▶ Hardware AES acceleration with sideband attack protection
- ▶ Automatic decryption and execution from external NOR flash memory
- ▶ Support for public key cryptography

As part of the Kinetis K series, Kinetis K8x MCUs are performance efficient and offer industry-leading low power while providing significant BOM savings through smart on-chip integration. To learn more about this breakthrough MCU visit www.nxp.com/Kinetis/K8x.

KINETIS K8X SECURE MCUs

Product	CPU		Communications	Hardware Security					
	Arm Cortex-M4	Memory		CRC	RNG	mmCAU	Crypto Co-processor	On-the-Fly Decryption from external Serial NOR	Anti-tamper
K80 Mainstream Security	150 MHz Cortex-M4 w/ Floating Point Unit (FPU)	256 KB Flash, 256 KB SRAM, 16 KB Cache, XIP QuadSPI, SDRAM Controller	1x Full-Speed Crystal-less	Y	Y	Y			
K81 Anti-tamper & Security co-processor	150 MHz Cortex-M4 w/ Floating Point Unit (FPU)	256 KB Flash, 256 KB SRAM, 16 KB Cache, XIP QuadSPI, SDRAM Controller	1x Full-Speed	Y	Y	Y	256-bit AES/ 192-bit 3DES/ public key	128-bit AES	Y
K82 Security co-processor	150 MHz Cortex-M4 w/ Floating Point Unit (FPU)	256 KB Flash, 256 KB SRAM, 16 KB Cache, XIP QuadSPI, SDRAM Controller	1x Full-Speed	Y	Y	Y	256-bit AES/ 192-bit 3DES/ public key	128-bit AES	

K80 SUB-FAMILY: SECURITY MCUs WITH QUADSPI

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	SRAM (KB)	Cache (KB)	USB Full-Speed Controllers	UART (Total)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	Enhanced SDHC (bit)	QuadSPI Interface	On-the-Fly Decryption from external Serial NOR	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Crypto Co-processor	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)
	MK80FN256VDC15	150	Y	Y	32ch	121	XFBGA	87	256	256	16	1	5	3	6/3/2	4	1	8	Y	-	2x8ch	2x2ch	3	18	1	2	5/4	Y	Y	Y	-	-	-	T16/F4
	MK80FN256VLL15	150	Y	Y	32ch	100	LQFP	66	256	256	16	1	5	3	6/3/2	4	1	8	Y	-	2x8ch	2x2ch	1	14	1	2	5/4	Y	Y	Y	-	-	-	T16/F4

Common Features

Ambiant Temp Range: -40° C to 105° C
Voltage Range: 1 .71-3 .6 V, Flash Write Voltage: 1 .71
Main OSC (Oscillator Crystal/Resonator): 32-40 KHz/8-32 MHz
48 MHz IRC, High Drive GPIOs (18 mA): 8
Debug: JTAG, cJTAG, SWD, PMC, MCG, NMI, CRC, DSP,
Trace: TPIU, FPB, DWT, ITM, ETM

1.2V voltage reference generator
PMC, MCG, NMI, CRC, DSP
PIT (32 bit): 1x4ch, Hardware Watchdog, Software Watchdog,
2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
USB Device Charge Detect, Crystal-less FS USB (device mode only)
Octal, DTR QuadSPI supports eXecution-In-Place (XIP)

K81 SUB-FAMILY: SECURITY MCUs WITH HW CRYPTOGRAPHIC CO-PROCESSOR, ANTI TAMPER AND QUADSPI

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	SRAM (KB)	Cache (KB)	USB Full-Speed Controllers	UART (Total)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	Enhanced SDHC (bit)	QuadSPI Interface	On-the-Fly Decryption from external Serial NOR	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Crypto Co-processor	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)
	MK81FN256VDC15	150	Y	Y	32ch	121	XFBGA	87	256	256	16	1	5	3	6/3/2	4	1	8	Y	128-bit AES	2x8ch	2x2ch	3	18	1	2	5/4	Y	Y	Y	256-bit AES/ 192-bit 3DES/ public key	Y	8	T17
	MK81FN256VLL15	150	Y	Y	32ch	100	LQFP	66	256	256	16	1	5	3	6/3/2	4	1	8	Y	128-bit AES	2x8ch	2x2ch	1	14	1	2	5/4	Y	Y	Y	256-bit AES/ 192-bit 3DES/ public key	Y	4	T17

Common Features

Ambiant Temp Range: -40° C to 105° C
Voltage Range: 1 .71–3 .6 V, Flash Write Voltage: 1 .71
Main OSC (Oscillator Crystal/Resonator): 32–40 KHz/8–32 MHz
48 MHz IRC, High Drive GPIOs (18 mA): 8
Debug: JTAG, cJTAG, SWD, PMC, MCG, NMI, CRC, DSP,
Trace: TPIU, FPB, DWT, ITM,ETM

1.2V voltage reference generator
PMC, MCG, NMI, CRC, DSP
PIT (32 bit): 1x4ch, Hardware Watchdog, Software Watchdog,
2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
USB Device Charge Detect, Crystal-less FS USB (device mode only)
Octal, DTR QuadSPI supports eXecution-In-Place (XIP)

K82 SUB-FAMILY: SECURITY MCUs WITH HW CRYPTOGRAPHIC CO-PROCESSOR AND QUADSPI

Footnotes	Part Number	CPU Frequency (MHz)	Single Precision FPU	MPU	DMA	Pin Count	Package	Total GPIOs	Total Flash Memory (KB)	SRAM (KB)	Cache (KB)	USB Full-Speed Controllers	UART (Total)	SPI Modules	SPI + Chip Selects	I ² C	I ² S	Enhanced SDHC (bit)	QuadSPI Interface	On-the-Fly Decryption from external Serial NOR	Motor Control PWM	Quad Decoder PWM	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Random Number Generator	Symmetric Crypto Accelerator	Crypto Co-processor	Tamper Detect	Number of External Tamper Pins	Evaluation Board (See Page 17)
	MK82FN256VDC15	150	Y	Y	32ch	121	XFBGA	87	256	256	16	1	5	3	6/3/2	4	1	8	Y	128-bit AES	2x8ch	2x2ch	3	18	1	2	5/4	Y	Y	Y	256-bit AES/ 192-bit 3DES/ public key	-	-	T16/ F4
	MK82FN256VLL15	150	Y	Y	32ch	100	LQFP	66	256	256	16	1	5	3	6/3/2	4	1	8	Y	128-bit AES	2x8ch	2x2ch	1	14	1	2	5/4	Y	Y	Y	256-bit AES/ 192-bit 3DES/ public key	-	-	T16/ F4

Common Features

Ambiant Temp Range: -40° C to 105° C
Voltage Range: 1 .71–3 .6 V, Flash Write Voltage: 1 .71
Main OSC (Oscillator Crystal/Resonator): 32–40 KHz/8–32 MHz
48 MHz IRC, High Drive GPIOs (18 mA): 8
Debug: JTAG, cJTAG, SWD, PMC, MCG, NMI, CRC, DSP,
Trace: TPIU, FPB, DWT, ITM,ETM

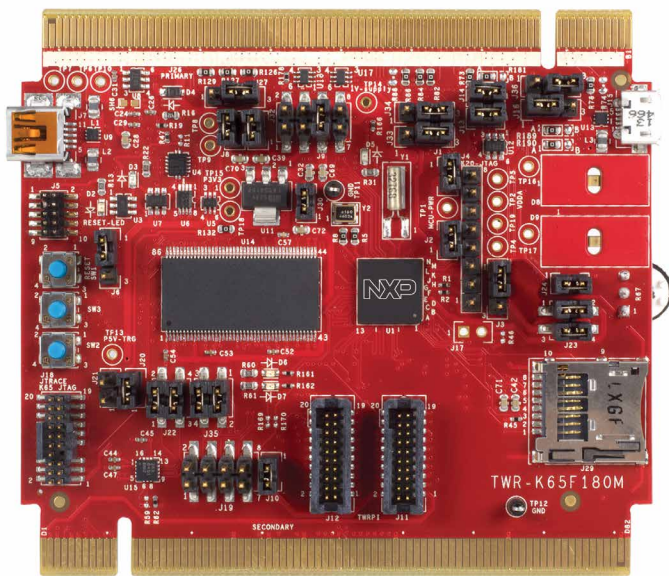
1.2V voltage reference generator
PMC, MCG, NMI, CRC, DSP
PIT (32 bit): 1x4ch, Hardware Watchdog, Software Watchdog,
2x FTM External Clk, 1x Low Power Timer, 1x Programmable Delay Block
USB Device Charge Detect, Crystal-less FS USB (device mode only)
Octal, DTR QuadSPI supports eXecution-In-Place (XIP)

Evaluation Hardware Support for Kinetis MCUs

Take your design to the next level with the Tower System platform. Our modular development platform offers interchangeable and reusable modules along with open source design files that offer a quick start for your customer designs.

The Freedom development platform is a small, low-power, cost-effective evaluation and development system perfect for quick application prototyping and demonstration. The Freedom platform is compatible with the Arduino™ standard enabling usage of a rich-set of third-party expansion boards. Many Freedom development platforms are also mbed™ enabled. Learn more at www.nxp.com/Kinetis/SW.

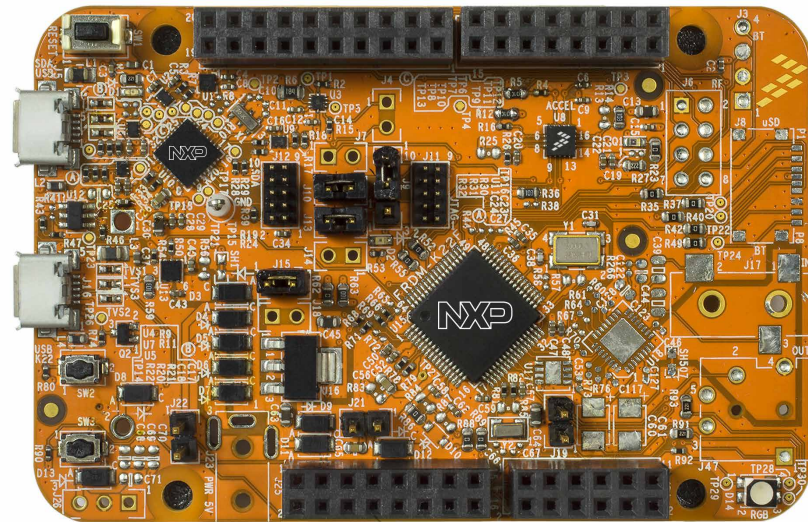
TOWER SYSTEM DEVELOPMENT BOARD



TWR-K65F180M

T1	TWR-K20D50M	Tower System Module for Kinetis K10/K20 50MHz MCUs
T2	TWR-K20D72M	Tower System Module for Kinetis K10/K20 72MHz MCUs
T3	TWR-K21D50M	Tower System Module for Kinetis K11/K21/K22 50MHz MCUs
T4	TWR-K21F120M	Tower System Module for Kinetis K21/K22 120MHz MCUs
T5	TWR-K22F120M	Tower System Module for Kinetis K65 MCUs
T7	TWR-K40D100M	Tower System Module for Kinetis K30/K40 100MHz MCUs
T8	TWR-K53N512	Tower System Module for Kinetis K5x MCUs
T9	TWR-K60D100M	Tower System Module for Kinetis K10/K20/K60 100MHz MCUs
T10	TWR-K60F120M	Tower System Module for Kinetis K10/20/60/61 120MHz MCUs
T11	TWR-K64F120M	Tower System Module for Kinetis K24/K64 120MHz MCUs
T13	TWR-K70F120M	Tower System Module for Kinetis K70 MCUs
T14	TWR-K24F120M	Tower System Module for Kinetis K24 120MHz MCUs
T15	TWR-K65F180M	Tower System Module for Kinetis K65 MCUs
T16	TWR-K80F150M	Tower System Module for Kinetis K80/K82 MCUs
T17	TWR-POS-K81	Point-of-Sales Tower System Module for Kinetis K81 MCUs

LOW-COST FREEDOM DEVELOPMENT PLATFORM



FRDM-K22F

F1	FRDM-K28FA	Freedom Development Platform for Kinetis K28/K27 MCUs
F2	FRDM-K22F	Freedom Development Platform for Kinetis K02 and K22 MCUs
F3	FRDM-K64F	Freedom Development Platform for Kinetis K24 and K64 MCUs
F4	FRDM-K82F	Freedom Development Platform for K80, K82 MCUs
F5	FRDM-K66F	Freedom Development Platform for Kinetis K26, K66, K65 MCUs

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